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LONG RANGE SEISMIC MEASUREMENTS

DUMONT

19 MAY 1966

Prepared for

AIR FORCE TECHNICAL APPLICATIONS CENTER

Washington, D. C.

15 SEPTEMBER 1966

By

EARTH SCIENCES DIVISION
TELEDYNE INDUSTRIES, INC.

Under

Project VELA UNIFORM

Sponsored By

ADVANCED RESEARCH PROJECTS AGENCY

Nuclear Test Detection Office

ARPA Order No. 624

LONG RANGE SEISMIC MEASUREMENTS

DUMONT

19 May 1966

SEISMIC DATA LABORATORY REPORT NO. 160

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AVAILABILITY

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DUMONT
EVENT DESCRIPTION

DATE: 19 May 1966

TIME OF ORIGIN: 13:56:28.1Z

YIELD:

MAGNITUDE: 5.48 ± 0.56

LOCATION:

SITE: Nevada Test Site, Area U2t

GEOGRAPHIC COORDINATES:

Lat: 37°06'40.0" N

Long: 116°03'29.0" W

ENVIRONMENT:

GEOLOGIC MEDIUM: Tuff

SURFACE ELEVATION: 4195 ft.

SHOT ELEVATION: 1995 ft.

SHOT DEPTH: 2200 ft.

COMPUTED EPICENTER: ALL STATIONS

GEOGRAPHIC COORDINATES:

Lat: 37°02'06.0" N

Long: 116°07'19.2" W

TIME OF ORIGIN: 13:56:32.8Z

DEPTH: 48.5 km

EPICENTER SHIFT: 10.2 km, S 34° W

Code	Station	Final						Tape	P
		SPZ	SPR	SPT	LPZ	LPR	LPT		
MN-NV	Mina, Nevada	+	+	+	+	+	+	*	P
KN-UT	Kanab, Utah	+	+	+	-	+	+	*	P
TFSO-Z1	Tonto Forest Observatory, Arizona	+	+	+	+	+	+	*	P
UBSO-Z10	Uinta Basin Observatory, Utah	+	+	+	-	+	+	*	P
BMSO-Z2	Blue Mountain Observatory, Oregon	+	+	+	+	+	+	*	P
LAO	Suparray, A0-10, Montana	+	N	N	N	N	N	*	P
SW-MA	Sweetgrass, Montana	+	+	+	+	+	+	*	P
RG-SD	Redig, South Dakota	+	+	+	+	+	+	*	P
WN-SD	Winner, South Dakota	+	+	+	+	+	+	*	P
WMSO-Z6	Wichita Mountain Observatory, Oklahoma	+	+	+	+	+	+	*	P
CR-MD	Crete, Nebraska	+	+	+	+	+	+	*	P
JP-AT	Jasper, Alberta, Canada	+	+	+	+	+	+	*	P
KC-MO	Kansas City, Missouri	+	+	+	+	+	+	*	P
PG-BC	Prince George, British Columbia, Canada	+	+	+	I	I	I	*	P
ST-BC	Smithers, British Columbia, Canada	+	+	+	I	I	I	*	P
RL-ON	Red Lake, Ontario, Canada	+	+	+	+	+	+	*	P
CPSO-ZR	Cumberland Plateau Observatory, Tennessee	+	+	+	+	+	+	*	P
AX-AL	Alexander City, Alabama	+	+	+	+	+	+	*	P
BF-FL	Belleview, Florida	+	+	-	+	I	-	*	P
HN-ME	Houlton, Maine	+	+	+	+	+	+	*	P
SM-QB	Schefferville, Quebec, Canada	+	+	+	+	+	+	*	P
NP-NT	Mould Bay, Northwest Territories, Canada	+	+	+	+	+	I	*	P

I Inoperative + Signal

N No Instrument - No Signal

P Primary Timing * Magnetic Tape Available

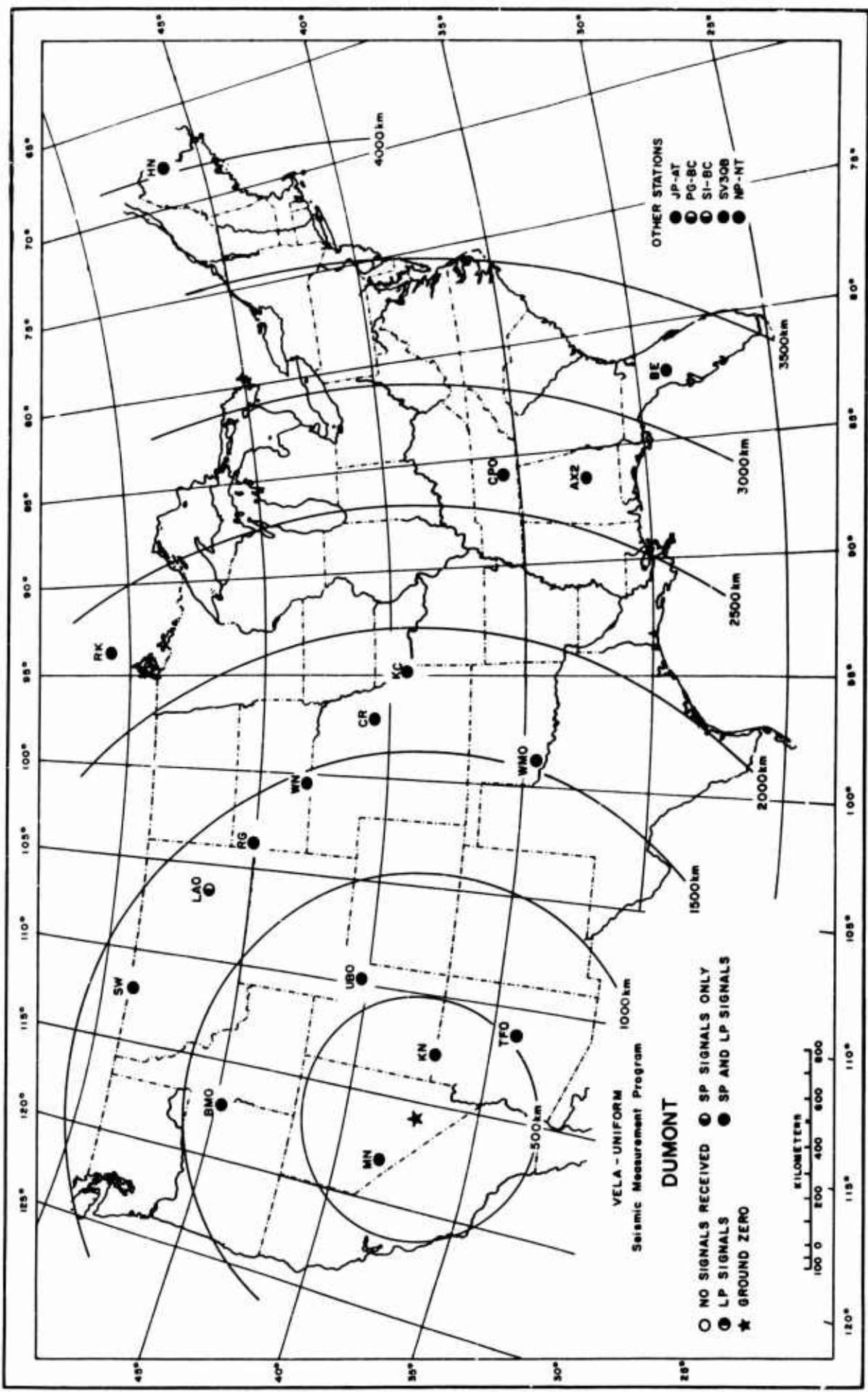
S Secondary Timing

Station Status Report - DUMONT

Table 1

Figure 1

Recording Stations and Signals Received



INTRODUCTION

A long range seismic measurements (LRSM) program and several larger seismographic observatories were established under VELA-UNIFORM to record seismological data resulting from natural seismic activity and a planned series of U. S. underground nuclear tests. The LRSM teams are mobile and occupy locations selected to provide optimum data from events of special interest; the observatories are permanent installations as follows:

Wichita Mountains Seismological Observatory (WMSO)
Lawton, Oklahoma

Uinta Basin Seismological Observatory (UBSO)
Vernal, Utah

Blue Mountain Seismological Observatory (BMSO)
Baker, Oregon

Cumberland Plateau Seismological Observatory (CPSO)
McMinnville, Tennessee

Tonto Forest Seismological Observatory (TFSO)
Payson, Arizona

Large Aperture Seismic Array (LASA)
Billings, Montana

The purpose of this report is to provide an analysis of data resulting from the DUMONT event recorded by the

LRSM teams and the VELA observatories and a preliminary summary of data reported by other permanent and temporary seismographic stations.

INSTRUMENTATION AND PROCEDURE

The instrumentation at each of the LRSM locations consists of three-component short-period and three-component long-period seismographs. In general, data are recorded on 35 millimeter film and on one-inch 14 channel magnetic tape although recently more portable instrumentation has been incorporated which records only on magnetic tape. The stations are all equipped to record WWV continuously to provide accurate time control and calibration is accomplished once each day and just prior to each shot at the operational settings. Pertinent information useful for analysis of LRSM data is available to qualified users of this data and is contained in Technical Report 65-43, "Interpretation and Usage of Seismic Data, LRSM program." General information on LRSM van and portable system equipment and operation is given in Technical Reports 66-27, "The LRSM Mobile Seismological Laboratory," and 65-74, "A Portable Seismograph." Copies of these reports may be obtained from DDC. The AD control number of Technical Report 66-27 is 480343. All the ob-

servatories have both long-period and short-period, three-component instrumentation, in addition to their other specialized facilities.

Station information is presented in Appendix I. This includes the station name and code; the geographic coordinates, distances and azimuths involved; the station elevations; and the type of instruments in use at each location. Representative instrumental response curves are shown in Appendix II(B).

The procedures used in measuring amplitudes reported herein is illustrated in Appendix II(A) and the unified magnitude is calculated as shown in Appendix I(B). The distance factors (B) beyond 16° are from Gutenberg and Richter*. For distances less than 16° values were read from a curve in the Gutenberg and Richter paper back to 10° and then extrapolated to 2° , using an inverse cube relationship.

A standard hypocenter location program for a digital computer is used to determine the location using data from all stations analyzed. Best-fit values of latitude, longi-

*Gutenberg, B. and Richter, C. F., Magnitude and Energy of Earthquakes, Ann. Geofis., 9 (1956), pp. 1-15

tude, depth of focus, and time of origin are determined statistically by a least squares technique. This utilizes a Jeffreys-Bullen travel-time curve as modified by Herrin in 1961 on the basis of Pacific surface-focus recordings. Precision of the computation is limited primarily by the accuracy of arrival times, the validity of the standard travel-time curve, and by local velocity deviations. Since the method is based on P-wave arrivals, this particular program does not make use of later phases such as pP and S in the determination of depth or location.

DATA AND RESULTS (LRSM and VELA OBSERVATORIES)

The parameters of the DUMONT event and a summary of the seismic evaluation is shown on the Event Description page. The operational status of the 22 LRSM stations and observatories is given in Table 1 and illustrated in Figure 1.

Table 2 summarizes the measurements made of the principal phases from the DUMONT event at the LRSM and VELA stations. Included are the Pn and P arrival times, the maximum amplitudes (A/T) of Pn or P motion and other phases as seen on the short-period vertical instruments. Long-period Love and Rayleigh wave motion are also tabulated in (A/T) form.

In addition, individual station Rayleigh wave areas (mm^2) is indicated as measured on the LPZ only. Although reduced to 1K magnification, they have not been normalized to any magnitude. Twenty-two stations recorded short-period signals. Long-period signals from this event were recorded by 19 stations.

The unified magnitudes determined from the LRSM and VELA observatories is shown in Figure 2. The average magnitude is 5.48 ± 0.56 .

The travel-time residuals from the Pn and P phases are shown in Figure 3. Figures 4 through 8 illustrate plots of the amplitude of P, Pg, Lg, LQ, and LR.

Attached to the report are illustrative seismograms showing the signals recorded at 4 stations. The most distant station analyzed that recorded DUMCNT was NP-NT at a distance of 4366 kilometers.

Principal Phases
DUMONT
14 May 1968
11:56:28.12

Code	Station	Distance (km)	Inet	Mean Elevation (in feet x 10)	Phase	Observed Travel Time		Period T (sec)	Maximum Amplitude A/T	Magnitude (P)	Area (km^2) LPZ				
						(min)	(sec)								
KN-NV	Mina, Nevada	216	SPZ	1.26	Pn	0	36.6	0.4	4122	5.98	1042.76				
			SPZ	0.59*	Pg	0	38.7	0.45	14.375	(48.053)					
			SPZ	0.746	LQ			1.01							
			LPT		LQ			---	---						
			LPZ	1.52	LR			14.0	2517						
KN-UT	Kanab, Utah	267	SPZ	1.005	Pn	0	43.2	0.6	2718	5.93	111.33				
			SPZ	1.005	e	0	44.6	0.6	2549	---					
			SPZ		Pn	0	48.1	---	---						
			SPZ		LQ			---	---						
			LPT	1.24*	LQ			14.0	1059						
TFSD	Tonto Forest Observatory, Utah	535	SPZ-1	6.0	Pn	1	14.9	0.6	315	5.93	---				
			SPZ-1	6.0	e	1	21.1	0.6	244						
			SPZ-1	1.0	Pg	1	29.3	1.3	2207						
			SPZ	1.0	LQ			1.3	2049						
			SPZ	1.0	LQ			1.1	2364						
			SPZ	2.0	LQ			(15.0)	(140)						
			SPZ	2.0	LQ			(15.0)	(126)						
			SPZ		LR			---	---						
			SPZ		LR			---	---						
			SPZ-10	4.85	Pn	1	15.7	0.9	760	6.48	65.88				
UBSO	Uinta Basin Observatory, Utah	667	SPZ-10	4.85	e	1	35.3	0.8	842						
			SPZ-10	4.85	e	1	41.1	0.95	461						
			SPZ-10	4.85	(P*)	1	46.2	0.9	532						
			SPZ-10	4.85	Pg	1	52.7	0.7	1681						
			SPZ	5.00	LQ			1.45	4673						
			SPZ	4.70	LQ			1.2	3114						
			SPZ	32.0*	LQ			15.0	182						
			SPZ	(38.0)*	LQ			15.0	(71.5)						
			SPZ	34.0*	LR			14.0	219						
			SPZ		LR			---	---						
BMSO	Blue Mountain Observatory, Oregon	866	SPZ-3	35.0	Pn	1	57.6	0.6	29.3	5.43	375.00				
			SPZ-3	35.0	e	1	59.0	0.45	49.6						
			SPZ-3	35.0	e	2	01.5	0.9	105.						
			SPZ-3	35.0	(P*)	2	05.8	(0.8)	(131.01)						
			SPZ-3	35.0	Pg	2	(24.3)	---	---						
			SPZ		LQ			---	---						
			SPZ		LQ			---	---						
			SPZ	1.0	LQ			(17.0)	(83.3)						
			SPZ	1.0	LQ			16.0	256						
			SPZ	1.0	LR			14.0	554						
LAO	Subarray A0-10, Montana	1339	SPZ	350	Pn	2	52.6	1.0	22.1	5.44	375.00				
			SPZ	32.5	e	2	55.4	0.9	107						
			SPZ	32.5	PP	3	04.1	0.8	179						
			SPZ	32.5	e	3	29.0	0.8	115						
			SPZ	32.5	Pg	4	05.1	1.4	240						
SM-MA	Sweetgrass, Montana	1359	SPZ	84.3	P	2	57.8	0.9	99.8	5.18	207.72				
			SPZ	84.3	e	3	01.2	1.0	182						
			SPZ	84.3	e	3	03.4	0.9	99.3						
			SPZ	116.5*	PP	3	10.0	0.95	228						
			SPZ	84.3	e	3	22.1	0.8	133						
			SPZ	84.3	e	3	28.9	1.0	136						
			SPZ	84.3	Pg	3	49.0	0.8	144						
			SPZ	84.3	e	4	17.0	0.9	102						
			SPZ	129*	LQ			1.3	503						
			SPZ	90.5	LQ			(1.4)	(485)						
NG-ED	Redick, South Dakota	1381	SPZ	23.5*	PP	3	57.6	0.9	22.1	6.11	136.27				
			SPZ	42.0*	e	3	01.6	0.8	210						
			SPZ	42.0*	e	3	04.7	0.7	89.8						
			SPZ	42.0*	PP	3	07.3	0.7	131						
			SPZ	42.0*	e	3	14.3	0.8	(625)						
			SPZ	42.0*	e	3	24.5	0.8	252						
			SPZ	42.0*	e	3	31.0	0.8	289						
			SPZ	42.0*	Pg	3	51.0	(0.8)	(219)						
			SPZ	35.7*	LQ			2.0	2987						
			SPZ	16.2*	LQ			2.0	2590						
WN-SD	Winner, South Dakota	1510	SPZ	27.5*	P	3	(15.1)	(1.0)	(245)	(6.16)	113.33				
			SPZ	27.5*	(PP)	3	27.1	1.1	746						
			SPZ	27.5*	(Pg)	4	14.5	1.0	291						
			SPR	52.5*	LQ			1.6	844						
			SPT	60.7*	LQ			2.0	1352						
			LPT	21.6	LQ			14.0	353						
			LPT	18.5	LQ			15.0	104						
			SPZ	33.0	LR			12.0	361						
			SPZ	2.1	LR			15.0	213						
			SPZ		LR			---	50.95						
CR-NB	Crete, Nebraska	1709	SPZ	32.3	P	3	38.5	1.0	240	5.54	236.55				
			SPZ	32.3	e	3	44.8	1.0	457						
			SPZ	32.3	PP	3	49.4	0.7	191						
			SPZ	32.3	e	3	57.9	0.7	138						
			SPZ	32.3	e	4	10.0	0.7	92.9						
			SPZ	32.3	(Pg)	4	(41.9)	(0.7)	(85.0)						
			SPR	14.55	LQ			1.0	601						
			SPT	17.2	LQ			1.0	727						
			LPT	11.8	LQ			14.0	312						
			LPT	10.55	LQ			14.0	305						
JP-AT	Jasper, Alberta, Canada	1762	SPZ	150.3	P	3	46.1	0.6	8.0	3.86	401.83				
			SPZ	150.3	e	3	48.1	(1.0)	(180)						
			SPZ	88.1*	e	3	54.5	0.8	100						
			SPZ	150.3	PP	4	07.6	1.0	93.2						
			SPZ	150.3	(Pg)	4	31.4	1.0	66.2						
			SPZ	150.3	e	4	51.0	1.1	91.6						
			SPR	144	LQ			(1.6)	275						
Principal Phases - DUMONT															
Table 2 - Page 1															

Principal Phases
DUMONT
19 May 1966
11:56:28.12

Code	Station	Distance (km)	Inst.	Magnification (x) Film & 10	Phase	Observed Travel Time		Period T (sec)	Maximum Amplitude A/T	Magnitude (m)	Area (mm ²) EPZ			
						(min)	(sec.)							
KC-MO	Kansas City, Missouri	1685	SPZ	50.2	P	3	5d.8	1.0	(189)	(7.14)	260,11			
			SPZ	50.2	e	4	02.5	1.3	402	402				
			SPZ	50.2	PP	4	12.7	0.65	94.8	94.8				
			SPZ	50.2	e	4	35.4	0.7	64.3	64.3				
			SPZ	50.2	e	4	56.1	(0.8)	(56.7)	(56.7)				
			SPZ	50.2	(Pq)	5	10.8	(0.9)	(101)	(101)				
			SPZ	48.7	Lg			1.1	159	159				
			SPZ	48.6	Lg			1.0	134	134				
			LPT	21.3	LQ			16.0	138	138				
			LPT	16.3	LQ			(16.0)	(257)	(257)				
PG-BC	Prince George, British Columbia, Canada	1943	SPZ	184	P	4	00.6	1.3	74.3	4.77	4.77			
			SPZ	184	e	4	09.1	1.3	306					
			SPZ	194	e	4	(11.8)	1.3	254					
			SPZ	184	e	4	54.6	1.6	98.2					
			SPZ	184	(Pq)	5	37.6	1.2	49.5					
			SPZ	184	e	6	06.7	1.4	50.9					
			SPZ	139	Lg			1.7	141					
			SPZ	147	Lg			2.15	271					
SI-BC	Smithers, British Columbia, Canada	2138	SPZ	177	e	4	27.7	(0.7)	(15.9)	(4.55)	(4.55)			
			SPZ	129.3*	e	4	21.2	0.7	103					
			SPZ	129.3*	e	4	30.6	1.3	174					
			SPZ	129.3*	e	4	36.2	1.3	236					
			SPZ	129.3*	PP	4	44.2	1.3	151					
			SPZ	129.3*	e	4	48.6	1.2	160					
			SPZ	129.3*	e	5	00.9	1.3	159					
			SPZ	129.3*	(Pq)	6	09.1	1.4	99.0					
			SPZ	161	Lg			(1.9)	(85.8)					
			SPZ	180	Lg			2.1	156					
BK-ON	Red Lake, Ontario, Canada	2341	SPZ	48.0*	P	4	45.5	0.8	467	5.77	5.77			
			SPZ	48.0*	e	4	47.0	1.05	905					
			SPZ	51.5	e	4	54.5	0.9	118					
			SPZ	51.5	e	5	00.5	0.8	103					
			SPZ	51.5	PP	5	06.6	0.9	122					
			SPZ	48.0*	e	5	22.7	0.8	80.4					
			SPZ	51.5	Lg			1.5	131					
			LPT	35.6	LQ			17.0	29.6					
			LPZ	45.1	LR			12.0	83.8					
			SPZ	45.1	LQ			12.0	83.8					
CPRO	Cumberland Plateau Observatory, Tennessee	2730	SPZ-B	45.0	P	5	(21.8)	0.85	103	5.42	5.42			
			SPZ-B	45.0	e	5	21.3	0.9	139					
			SPZ-B	45.0	e	5	13.4	0.9	87.4					
			SPZ-B	45.0	e	5	43.4	1.3	77.1					
			SPZ-B	45.0	PP	5	52.4	0.85	70.2					
			SPN		Lg			---	---					
			SPE		Lg			---	---					
			LPN	22.0	LQ			17.0	97.5					
			LPR	19.0	LQ			19.0	19.9					
			LPZ	1.0	LR			13.0	360					
AX-ZAL	Alexander City, Alabama	2764	SPZ	176.2*	P	5	(25.1)	0.75	128	5.58	5.58			
			SPZ	176.2*	e	5	26.8	(1.0)	(291)					
			SPZ	176.2*	e	5	38.6	0.95	41.4					
			SPZ	174.1	e	5	40.9	0.9	42.9					
			SPZ	174.1	e	7	(17.1)	1.0	24.4					
			LPR	43.4	(S)	9	36.9	16.0	11.8					
			LPT	31.8	(S)	9	40.9	17.0	9.6					
			SPB	171	Lg			(2.4)	(194)					
			SPZ	170	Lg			(2.4)	(114)					
			LPR	43.3	LQ			21.0	38.5					
BF-FL	Bellevue, Florida	1285	LPT	31.8	LQ			20.0	79.8	292.25	292.25			
			SPZ	11.2	L			0.8	83.0					
			SPZ	29.4	LQ			(2.0)	(127)					
			LPT	4.24	LR			(34.0)	(4.0)					
			LPZ	3.08	LR			16.0	115					
HN-ME	Houlton, Maine	4366	SPZ	103	P	7	07.9	0.8	58.9	5.31	5.31			
			SPZ	103	e	7	09.1	0.8	102					
			SPZ	103	e	7	10.4	0.9	67.4					
			SPZ	103	e	9	31.0	0.7	11.7					
			SPZ	103	PP	9	32.2	0.8	17.8					
			SPZ	49.0	LQ			2.0	106					
			LPT	8.0	LQ			16.0	129					
			LPZ	20.0	LR			13.0	82.6					
			SPZ	20.0	LQ			13.0	82.6					
			SPZ	111	Lg			2.4	94.7					
SV-IQB	Schafferville, Quebec, Canada	41MH	SPZ	108	P	7	16.2	0.9	83.7	5.42	5.42			
			SPZ	108	e	7	18.2	0.8	139					
			SPZ	108	e	7	24.0	0.8	36.6					
			SPZ	108	e	7	31.0	0.9	19.5					
			SPZ	108	e	7	44.1	0.9	42.8					
			SPZ	108	(PP)	8	(44.4)	1.0	22.0					
			SPZ	108	e	9	11.2	0.75	14.5					
			SPZ	108	e	10	128.31	0.9	3.7					
			SPZ	108	LQ			2.4	94.7					
			LPT	28.0	LQ			(2.2)	(55.2)					
NP-AT	Mud Bay, Northwest Territories, Canada	4366	SPZ	28.0	LQ			14.0	37.0	57.90	57.90			
			SPZ	29.6	LQ			(14.0)	(19.3)					
			SPZ	20.2	LR			16.0	46.7					
			LPT	7.0	LQ			14.0	42.8					
			LPZ	12.7	LR			18.0	105					
			SPZ	20.2	LR			2.75	167					
AT m. sec	--- Maximum Amplitude Clipped on Film and Magnetic Tape													
	* Doubtful Values or Phases													
	• Measurements made from Playouts													

Principal Phases - DUMONT

Table 2 - Page 2

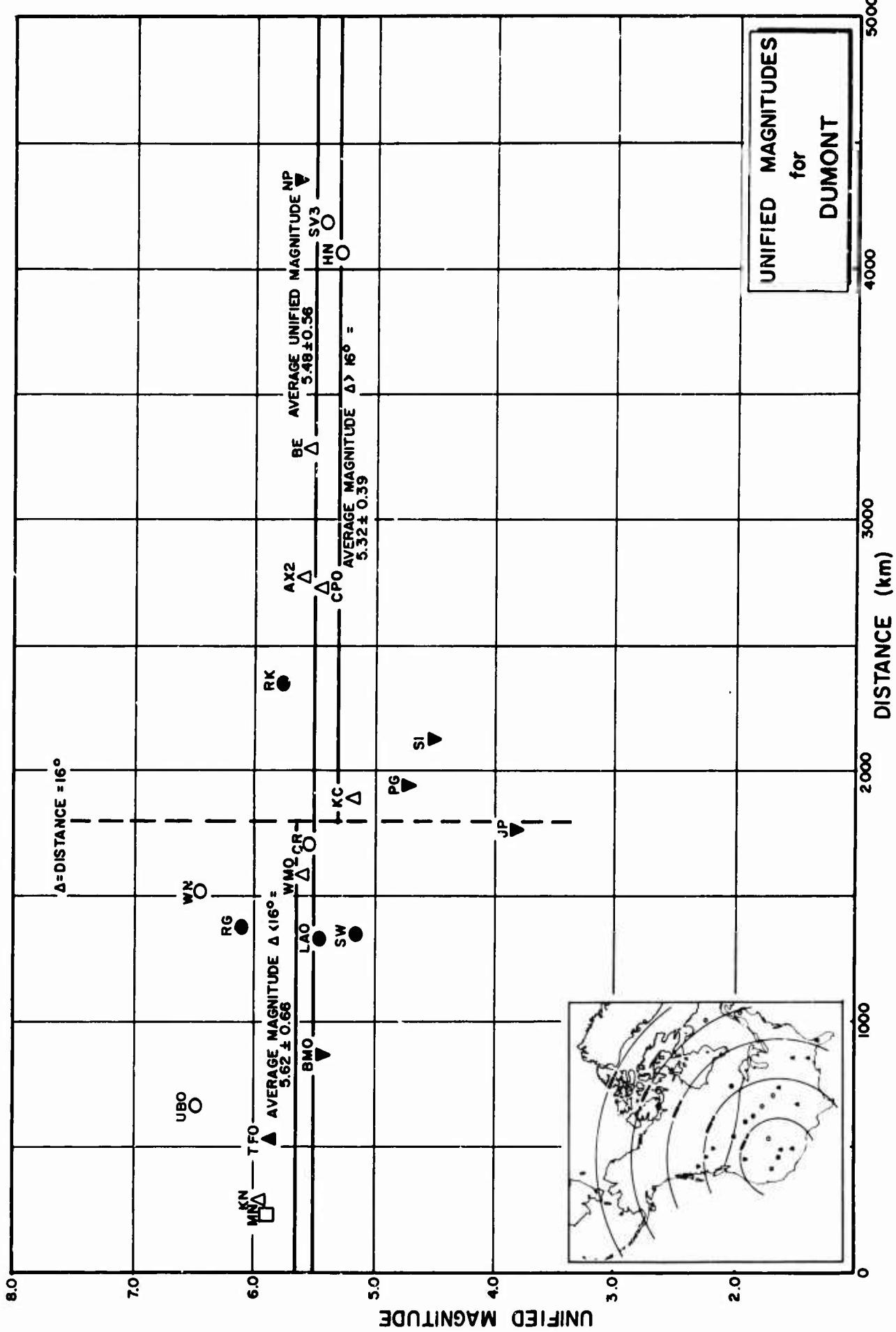
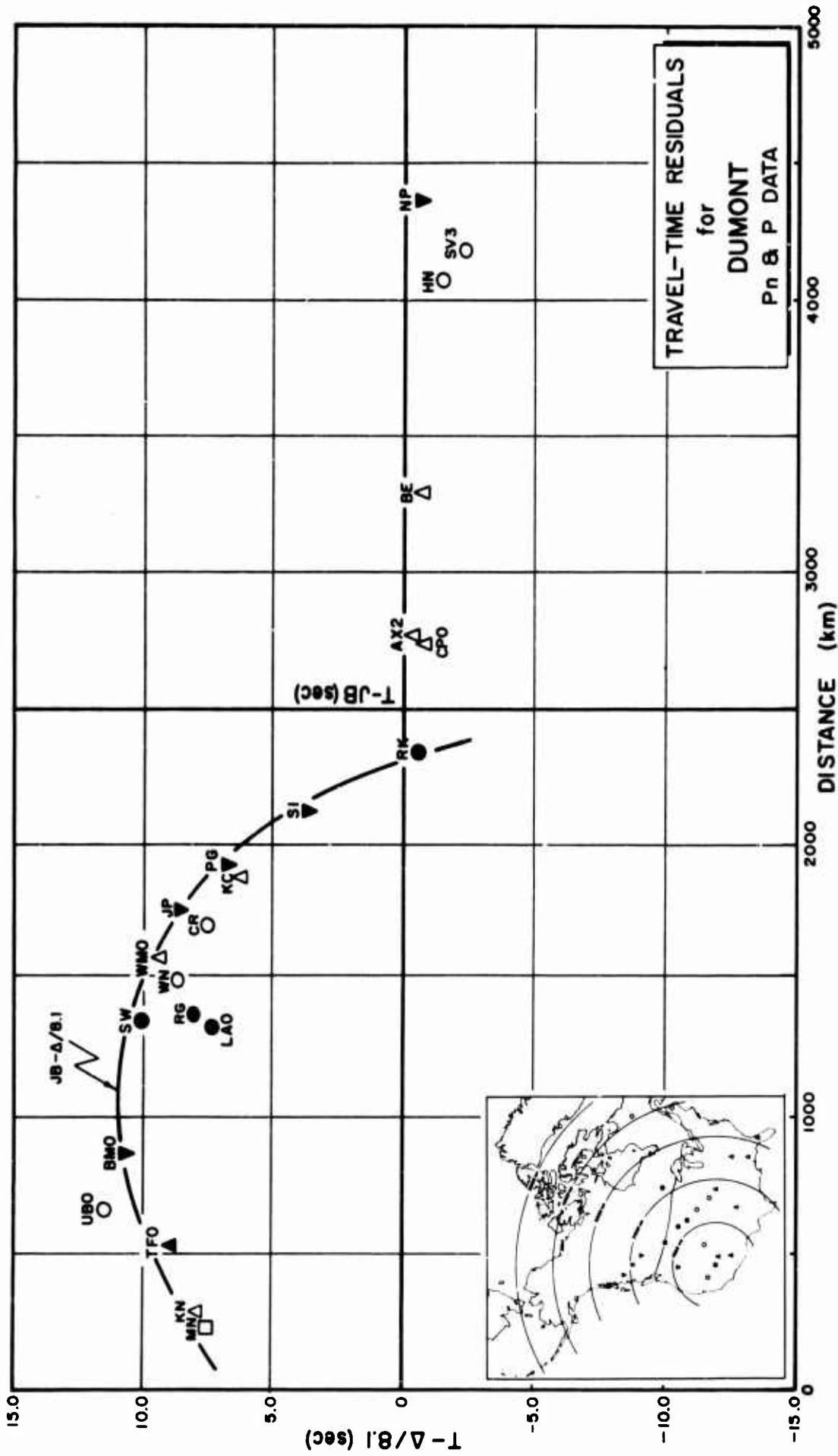


Figure 2

Figure 3



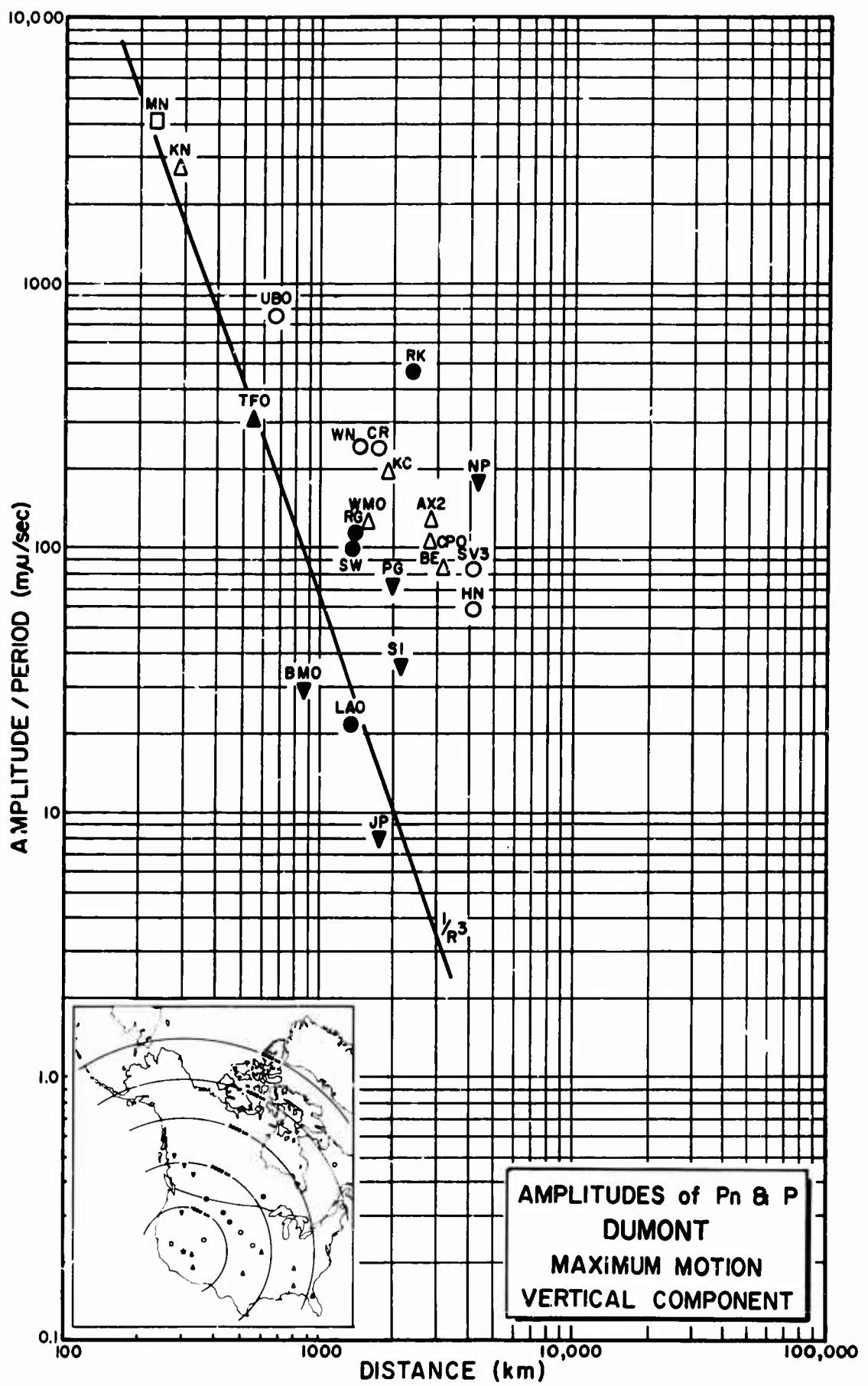


Figure 4

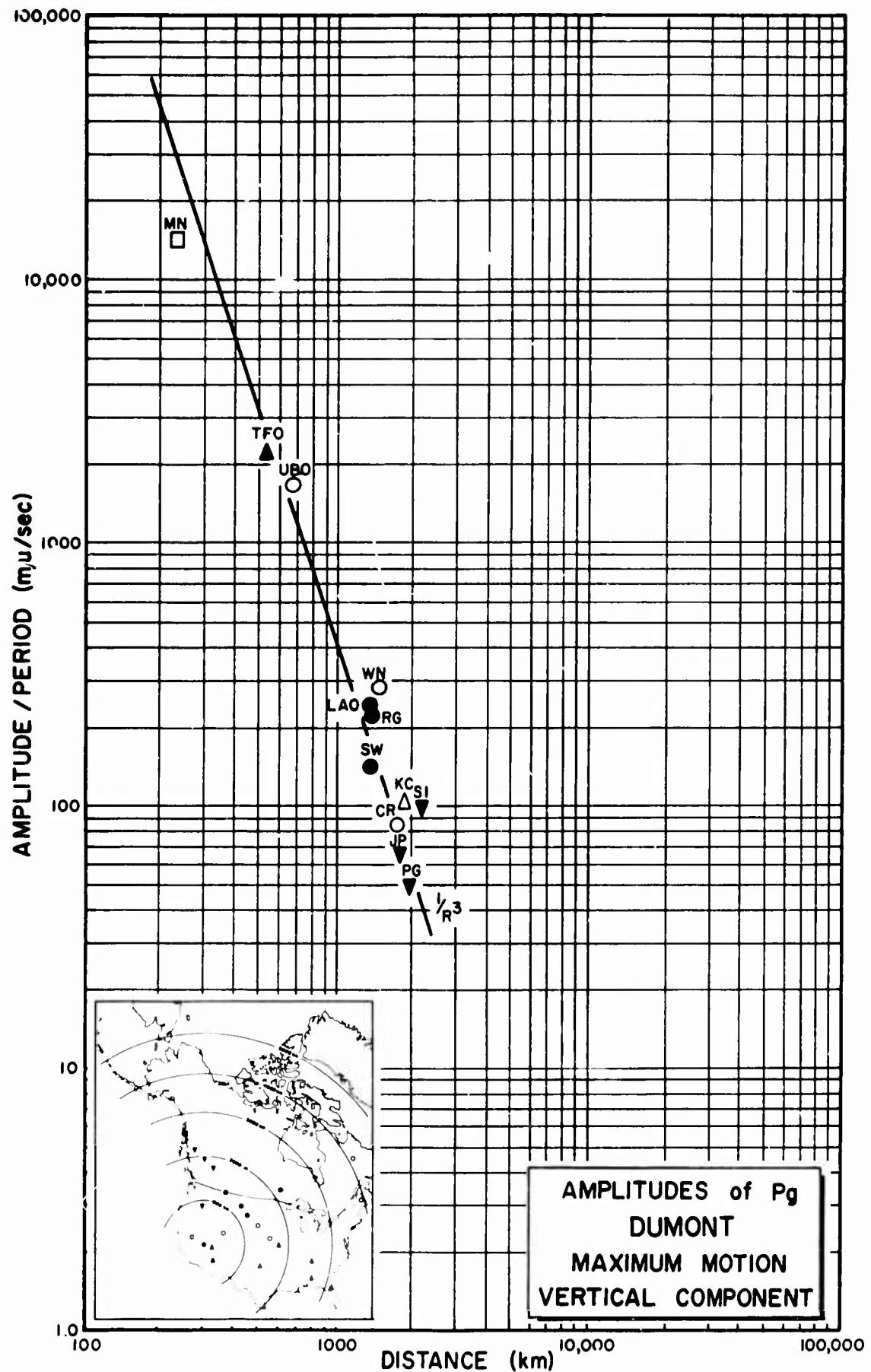


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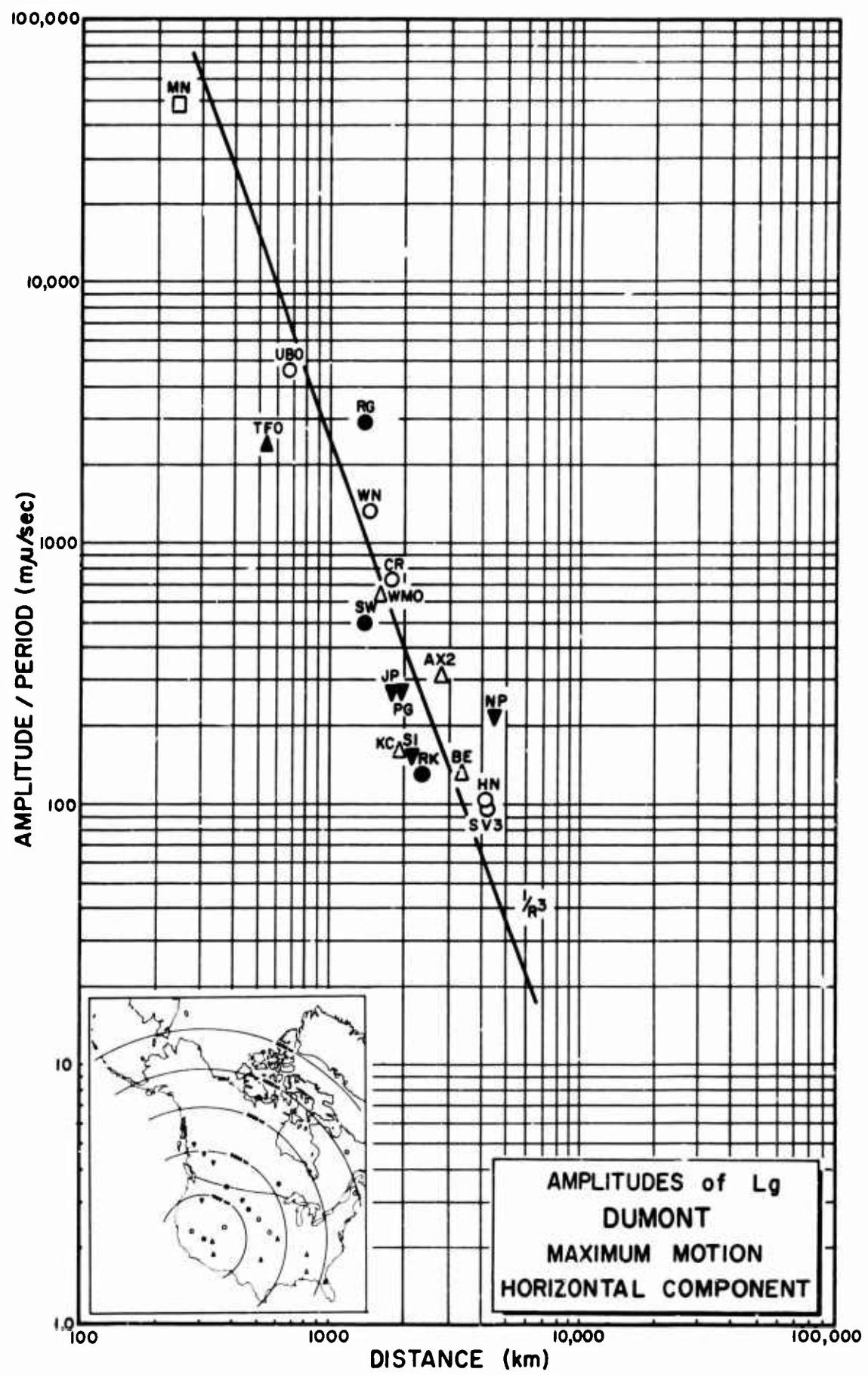


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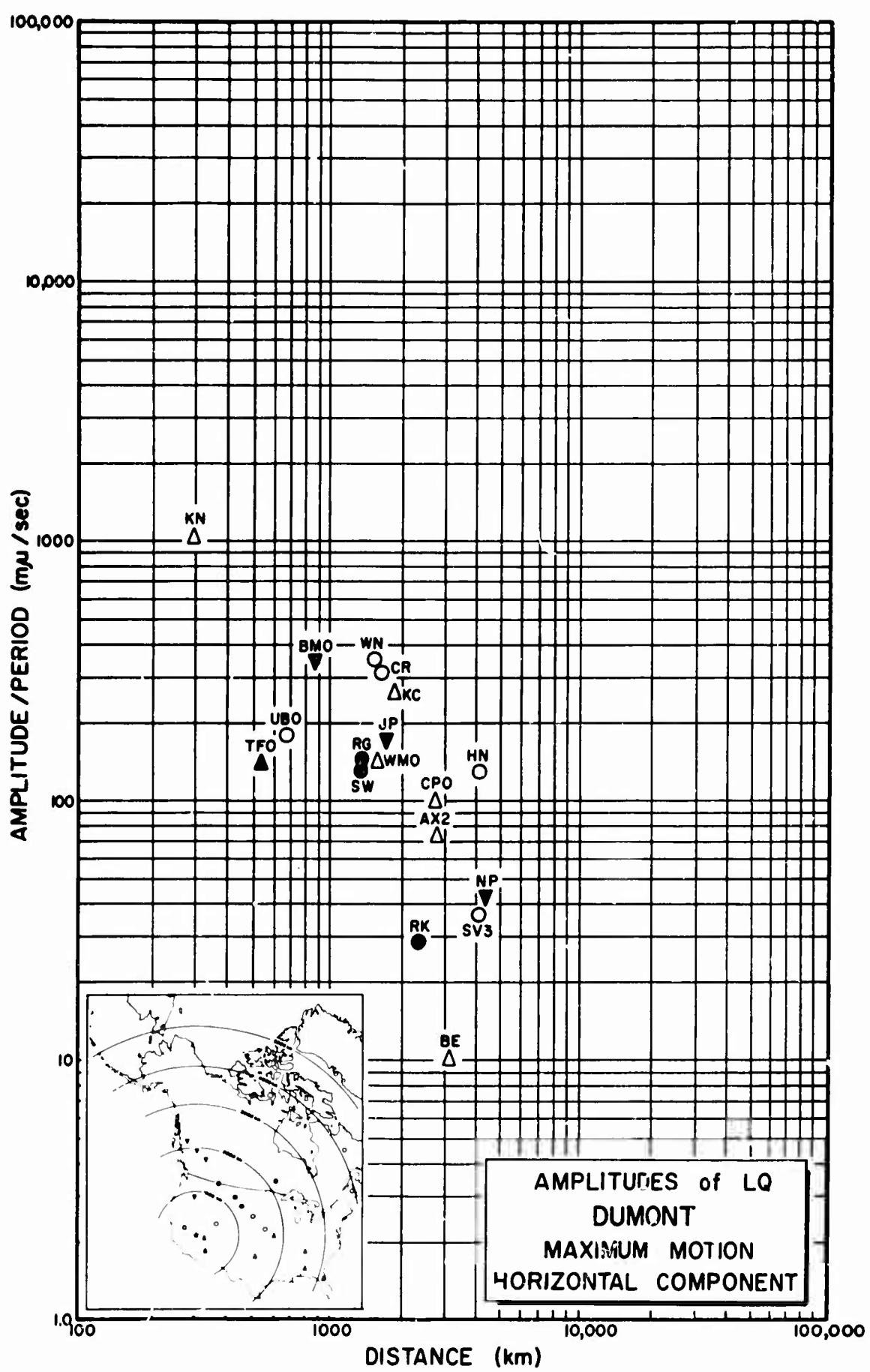


Figure 7

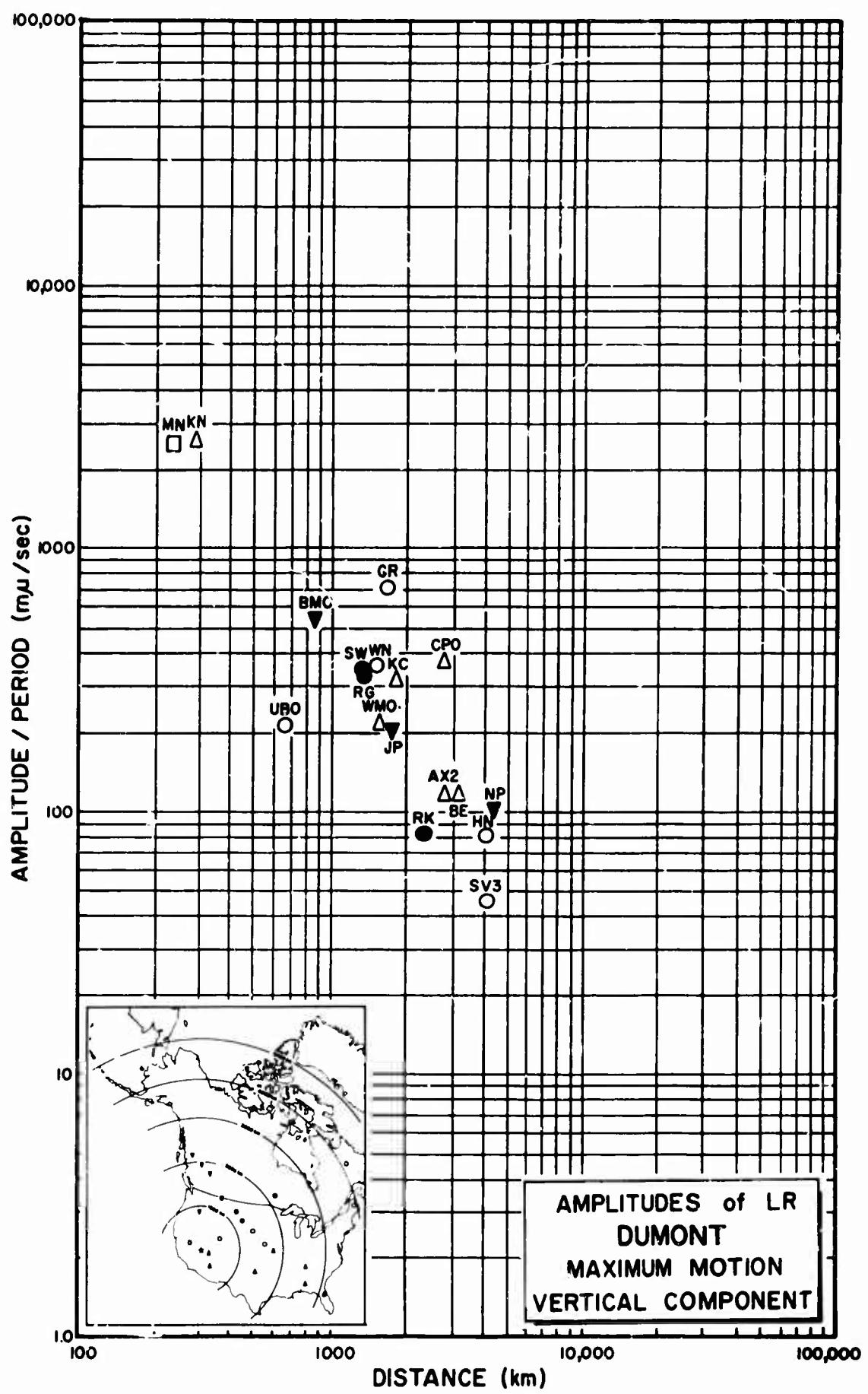


Figure 8

Code	Station	Distance (km)	Geographic Latitude	Geographic Longitude	Elev. (km)	Computed Azimuth		Installed Azimuth		Large or Small SP	LP Inst.
						Epi. Sta.	Sta. Epi.	Radial	Tang.		
MN-NV	Mina, Nevada	236	38°26'10" N	118°08'53" W	1.52	309°	128°	308°	38°	L	X
KN-UT	Kanab, Utah	287	37°01'22" N	112°49'39" W	1.74	91°	275°	95°	185°	L	X
TPSO-Z1*	Tonto Forest Observatory, Arizona	535	34°17'12" N	111°16'03" W	1.49	124°	307°	90°	0°	JM	X
UBSU-Z1*	Uinta Basin Observatory, Utah	667	40°19'18" N	109°34'07" W	1.60	56°	240°	90°	0°	JM	X
BMSO-Z3*	Blue Mountain Observatory, Oregon	866	44°50'56" N	117°18'20" W	1.19	353°	173°	0°	90°	JM	X
LAO	Subarray AO-10, Montana	1339	46°41'19" N	106°13'20" W	.90	34°	221°			HSZ	
SW-MA*	Sweetgrass, Montana	1359	48°58'08" N	111°57'46" W	1.11	13°	196°	121°	211°	S	X
RG-SD*	Redig, South Dakota	1381	45°12'59" N	103°32'05" W	.95	45°	2.4°	127°	217°	L	X
WN-SD*	Winner, South Dakota	1510	43°15'08" N	100°11'46" W	.79	58°	249°	129°	219°	L	X
WMSO-Z6*	Wichita Mountain Observatory, Oklahoma	1597	34°43'05" N	98°35'21" W	.51	94°	285°	90°	0°	JM	X
CR-NB*	Crete, Nebraska	1709	40°39'52" N	96°51'15" W	.44	71°	263°	131°	221°	L	X
JP-AT*	Jasper, Alberta, Canada	1762	52°53'50" N	118°05'25" W	1.13	355°	174°	114°	204°	L	X
KC-MO*	Kansas City, Missouri	1885	39°21'21" N	94°40'17" W	.27	76°	269°	133°	223°	S	X
PG-BC*	Prince George, British Columbia, Canada	1943	53°59'50" N	122°31'23" W	.91	347°	163°	110°	200°	L	X
SI-BC*	Smithers, British Columbia, Canada	2138	54°47'18" N	127°04'17" W	.58	340°	152°	107°	197°	L	X
RK-ON*	Red Lake, Ontario, Canada	2341	50°50'20" N	93°40'20" W	.37	42°	238°	58°	148°	S	X
CPSO-Z8*	Cumberland Plateau Observatory, Tennessee	2730	35°35'41" N	85°34'13" W	.57	84°	283°	90°	0°	JM	X
AX2AT*	Alexander City, Alabama	2764	32°46'38" N	86°07'48" W	.23	91°	288°	138°	228°	L	X
BE-FL*	Belleview, Florida	3285	28°54'19" N	82°03'52" W	.02	96°	295°	140°	230°	S	X
HN-ME	Houlton, Maine	4066	46°09'43" N	67°59'09" W	.21	60°	273°	93°	183°	S	X
SV3QB*	Schefferville, Quebec, Canada	4188	54°48'39" N	66°45'10" W	.58	46°	263°	139°	229°	S	X
NP-NT	Mould Bay, Northwest Territories, Canada	4366	76°15'08" N	119°22'18" W	.06	359°	176°	356°	86°	JM2 S	X

* Seismometers not orientated toward Nevada Test Site

Recording Site Information - DUMONT

Appendix I(A)

Unified Magnitude: $m = \log_{10} (A/T) + B$

where

A = zero to peak ground motion in millimicrons
 $= \frac{(\text{mm})}{K} (1000)$

K

T = signal period in seconds

B = distance factor (see Table below)

mm = record amplitude in millimeters zero to peak

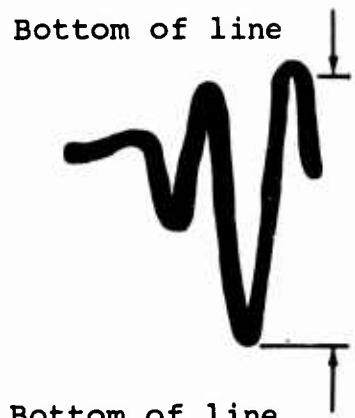
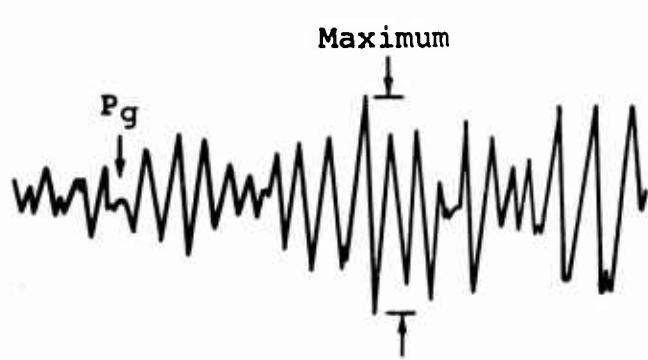
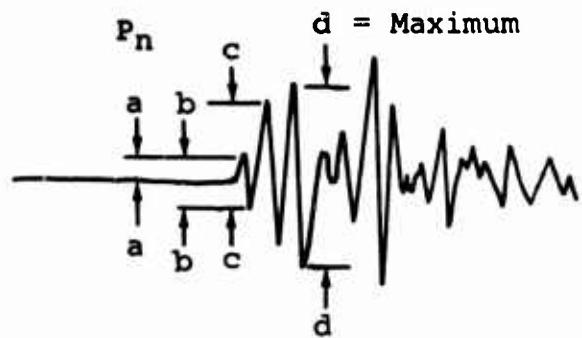
K = magnification in thousands at signal frequency

Table of Distance Factors (B) for Zero Depth

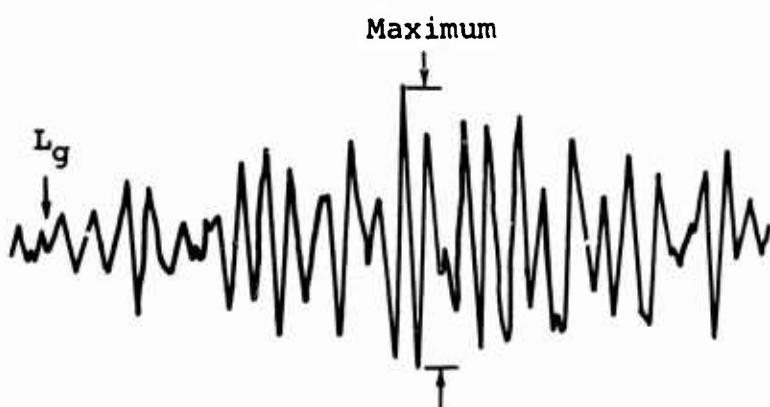
Dist (deg)	B	Dist (deg)	B	Dist (deg)	B	Dist (deg)	B
0°	-	27°	3.5	54°	3.8	80°	3.7
1	-	28	3.6	55	3.8	81	3.8
2	2.2	29	3.6	56	3.8	82	3.9
3	2.7	30	3.6	57	3.8	83	4.0
4	3.1	31	3.7	58	3.8	84	4.0
5	3.4	32	3.7	59	3.8	85	4.0
6	3.6	33	3.7	60	3.8	86	3.9
7	3.8	34	3.7	61	3.9	87	4.0
8	4.0	35	3.7	62	4.0	88	4.1
9	4.2	36	3.6	63	3.9	89	4.0
10	4.3	37	3.5	64	4.0	90	4.0
11	4.2	38	3.5	65	4.0	91	4.1
12	4.1	39	3.4	66	4.0	92	4.1
13	4.0	40	3.4	67	4.0	93	4.2
14	3.6	41	3.5	68	4.0	94	4.1
15	3.3	42	3.5	69	4.0	95	4.2
16	2.9	43	3.5	70	3.9	96	4.3
17	2.9	44	3.5	71	3.9	97	4.4
18	2.9	45	3.7	72	3.9	98	4.5
19	3.0	46	3.8	73	3.9	99	4.5
20	3.0	47	3.9	74	3.8	100	4.4
21	3.1	48	3.9	75	3.8	101	4.3
22	3.2	49	3.8	76	3.9	102	4.4
23	3.3	50	3.7	77	3.9	103	4.5
24	3.3	51	3.7	78	3.9	104	4.6
25	3.5	52	3.7	79	3.8	105	4.7
26	3.4	53	3.7				

Unified Magnitudes from Pn or P Waves

Appendix I(B)



Detail Showing Allowance
For Line Width

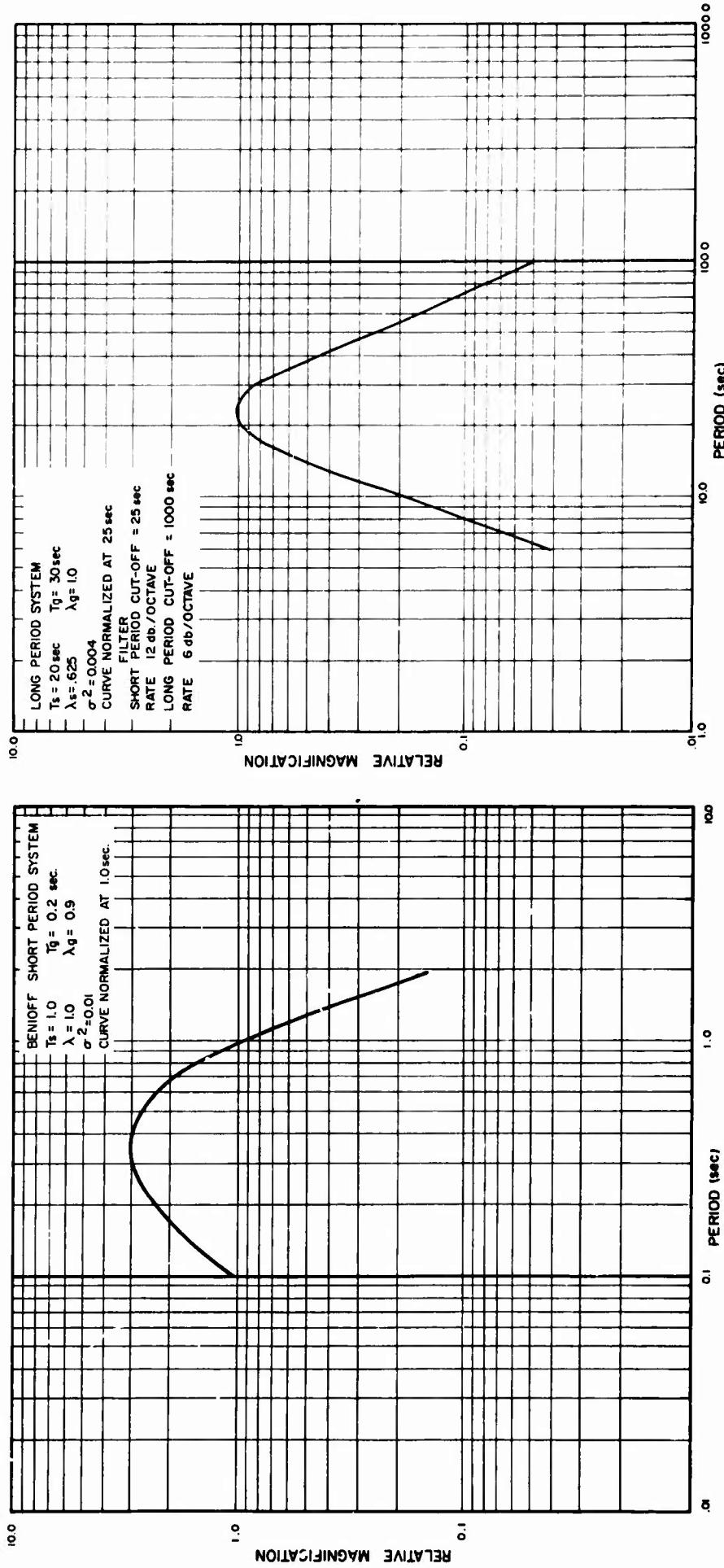


Pick time of P_n at beginning of "a" half cycle.

Pick amplitude of P_n as maximum " $d/2$ " within 2 or 3 cycles of "c".

Pick amplitudes of P_g and L_g at maximum of corresponding motion.

INSTRUMENT RESPONSE CURVES - LRSM



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13. ABSTRACT

An analysis of seismological data from an underground nuclear explosion as a continuing study to provide information to aid in distinguishing between earthquakes and explosions. A table of travel-times and amplitudes of P, Pg, Lg, and surface waves are included along with other unidentified phases.

Unclassified**Security Classification**

14. KEY WORDS	LINK A		LINK B		LINK C	
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Seismic Magnitude						
Seismic Travel-Time						
Seismic Amplitude						
VELA-UNIFORM						
Nuclear Tests						
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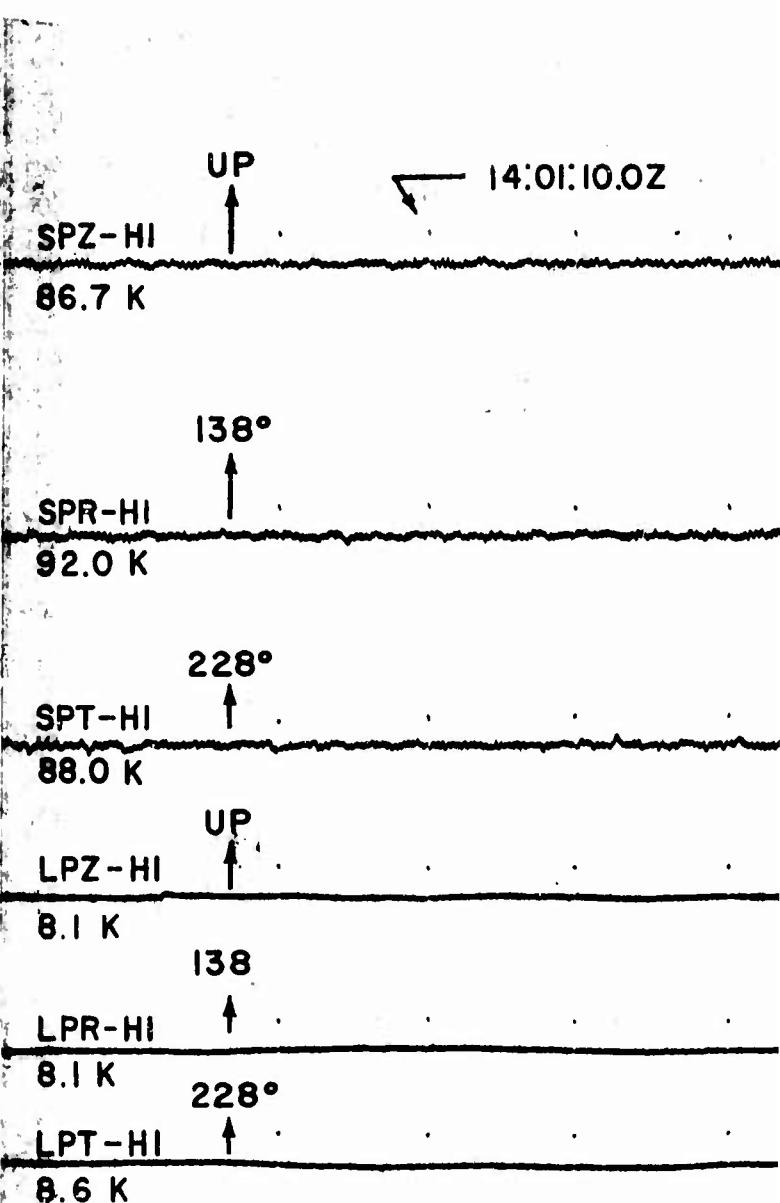
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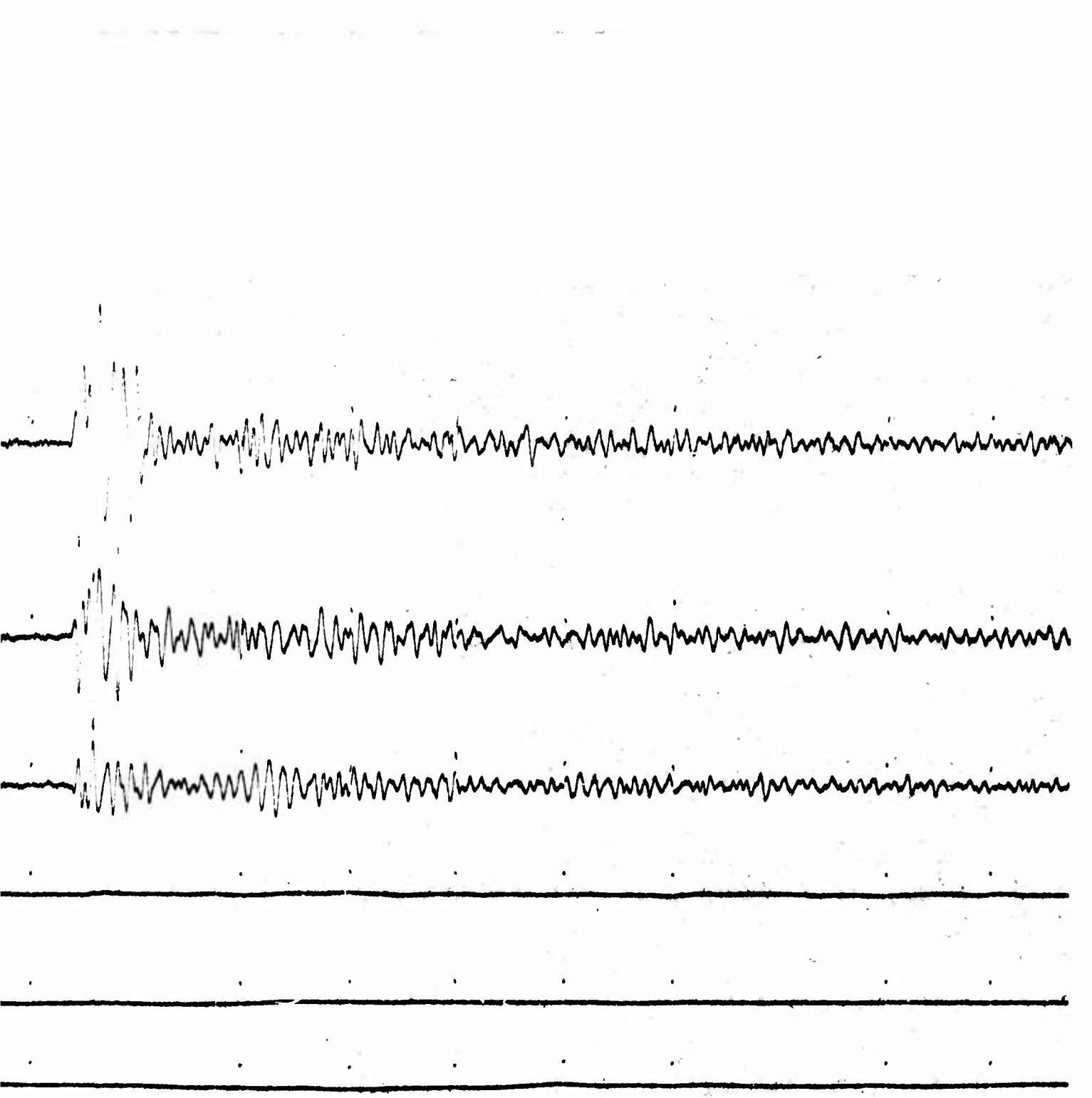
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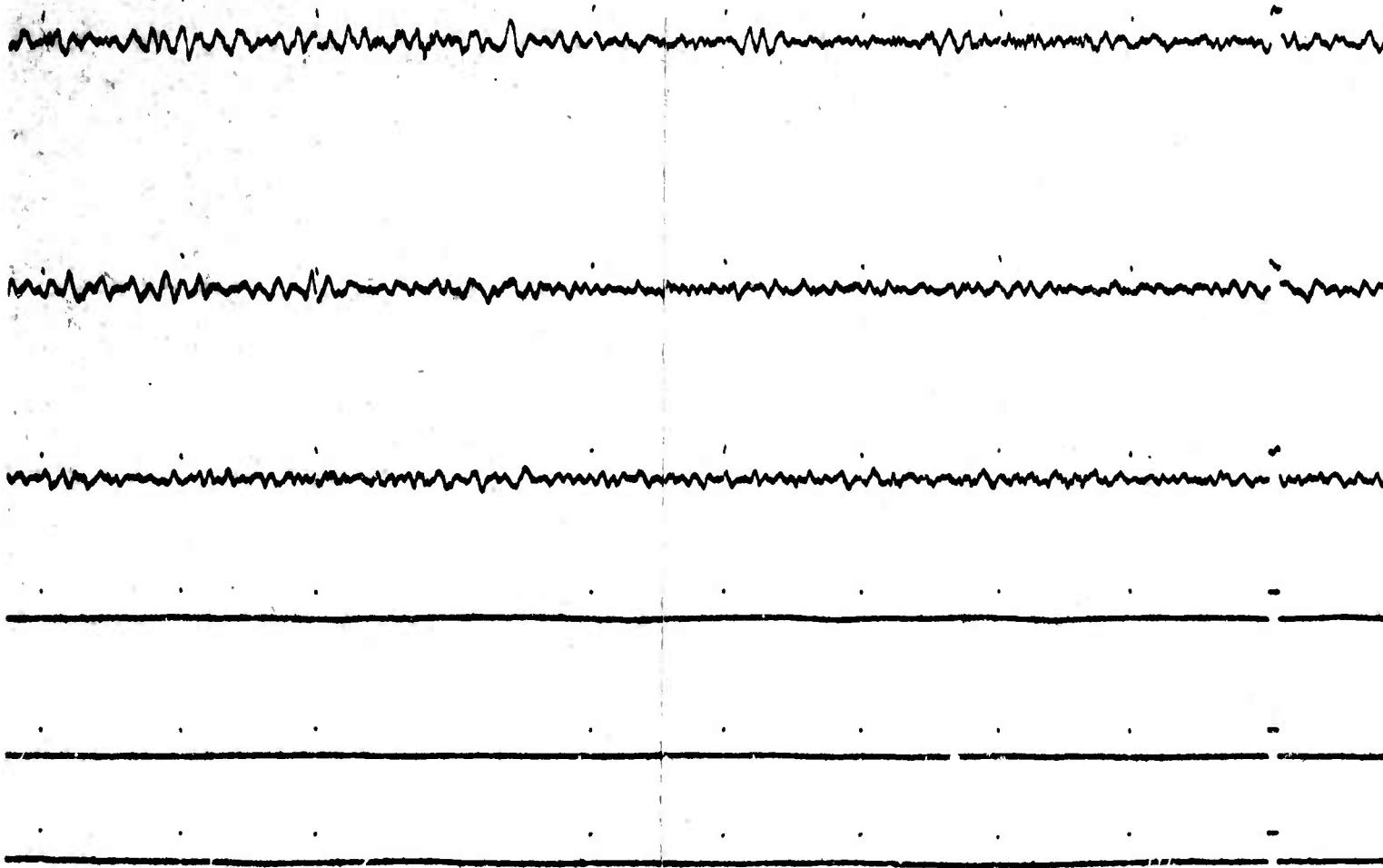
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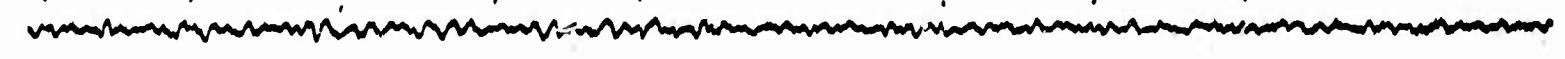
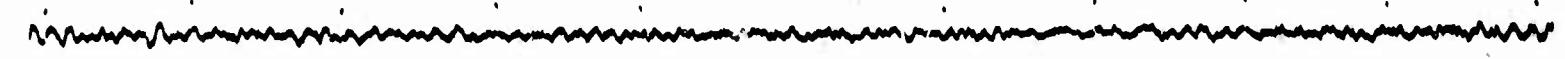
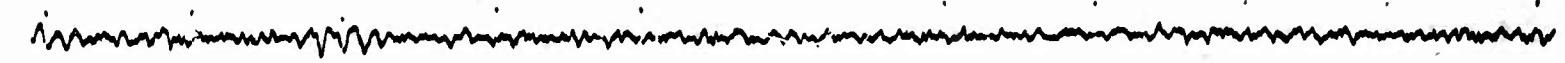
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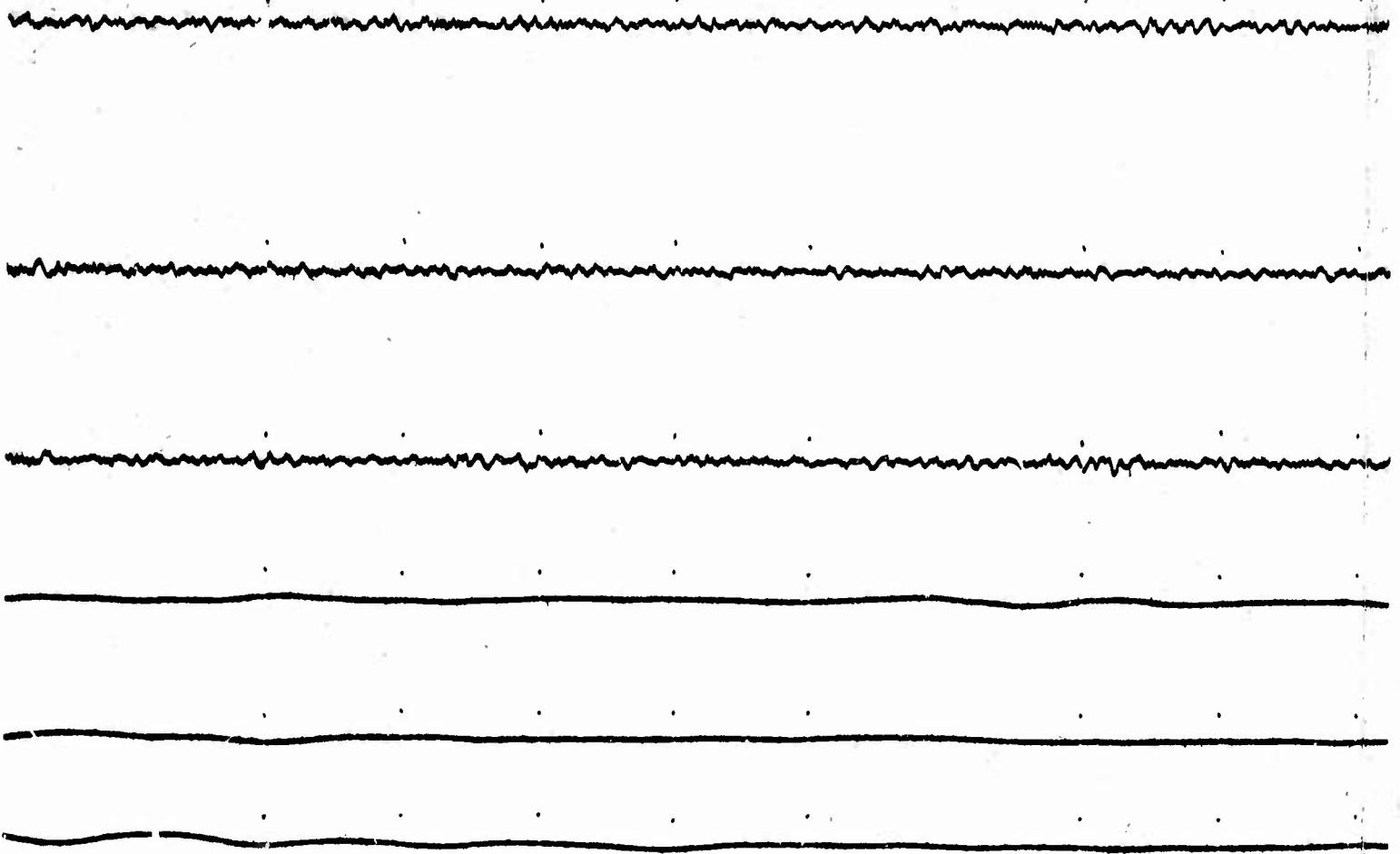
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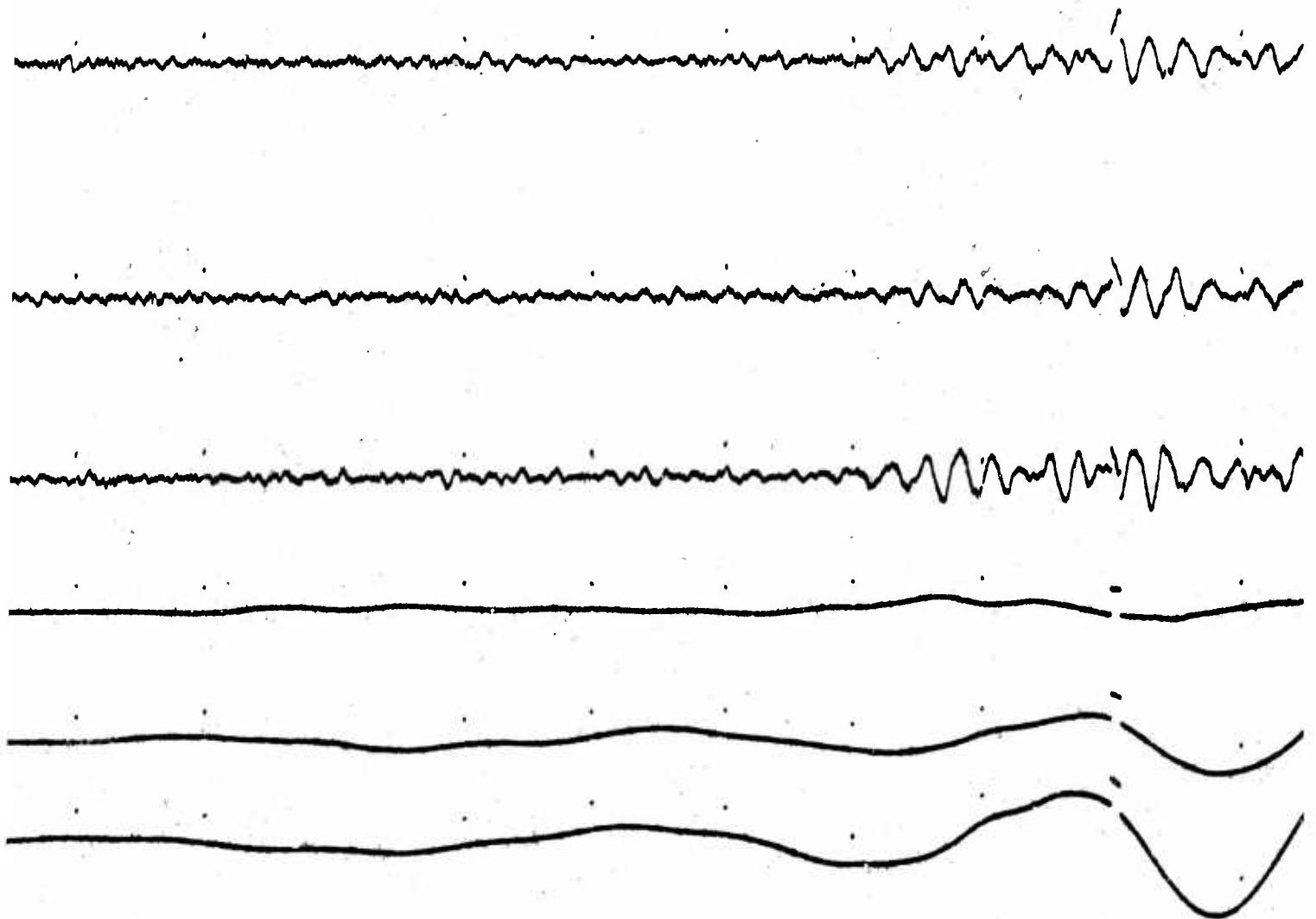
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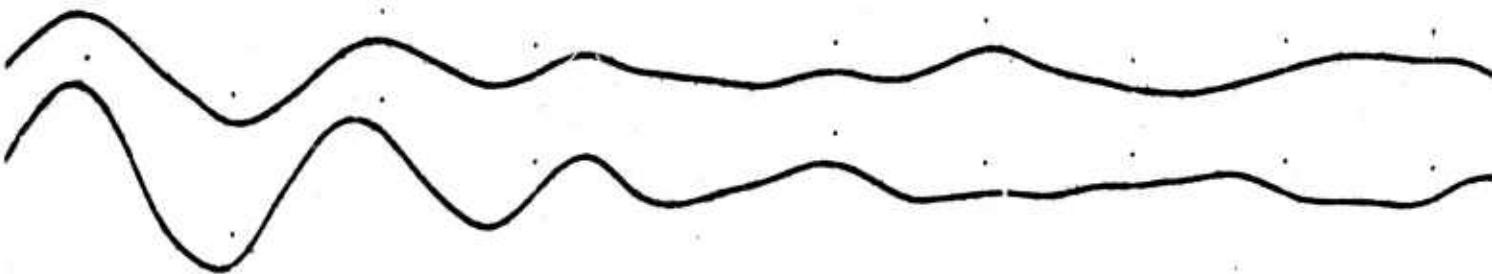
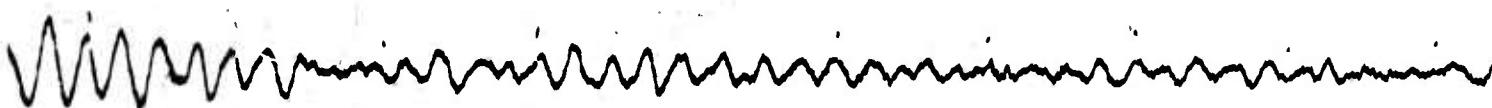
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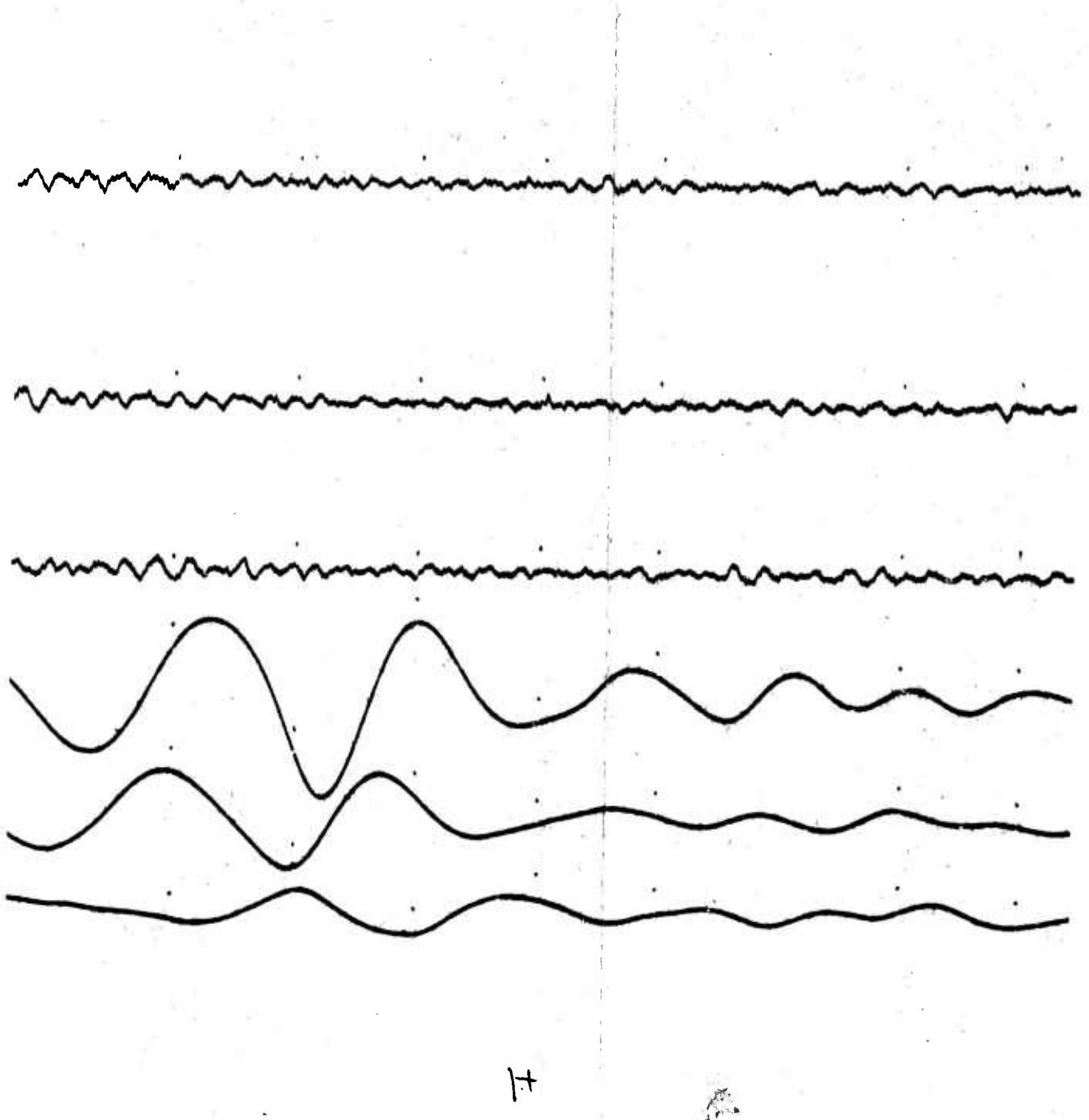
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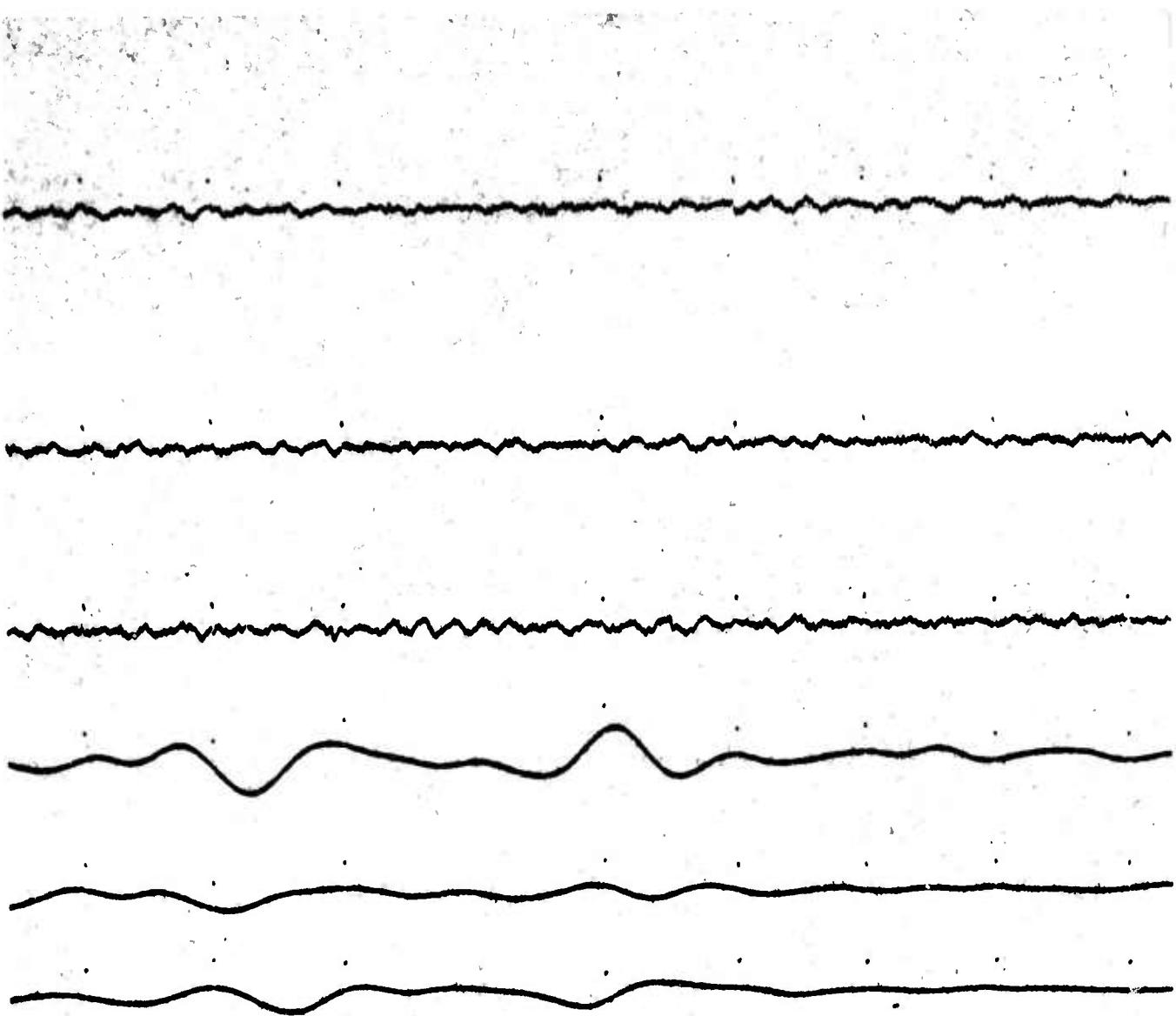


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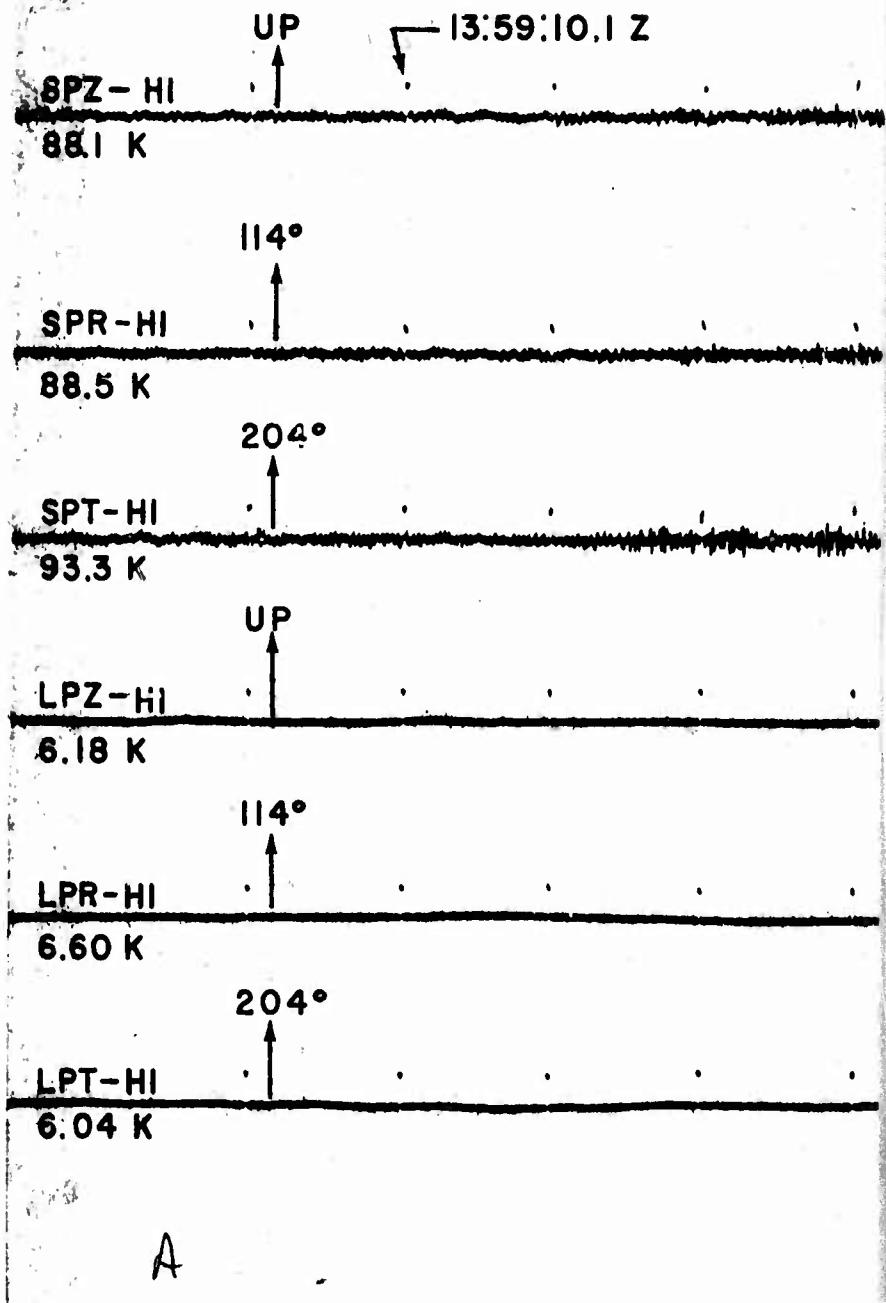
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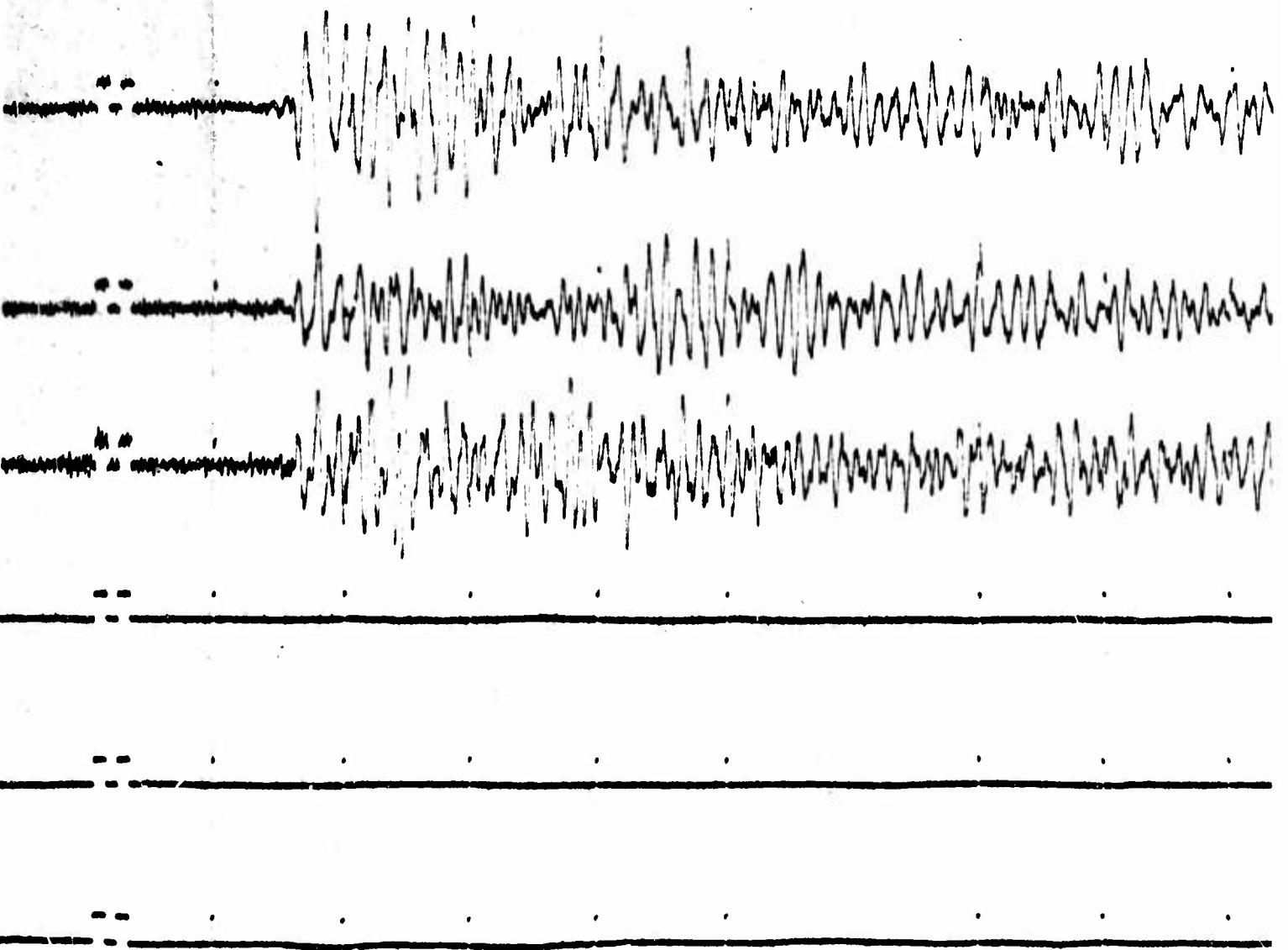
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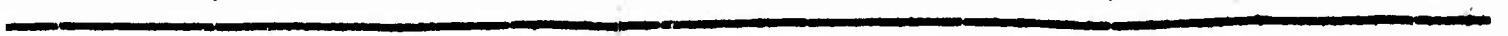
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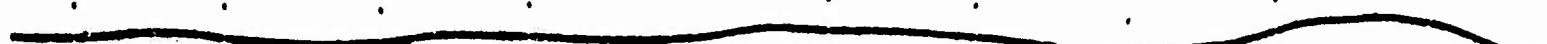
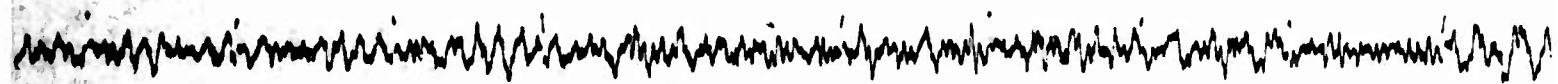




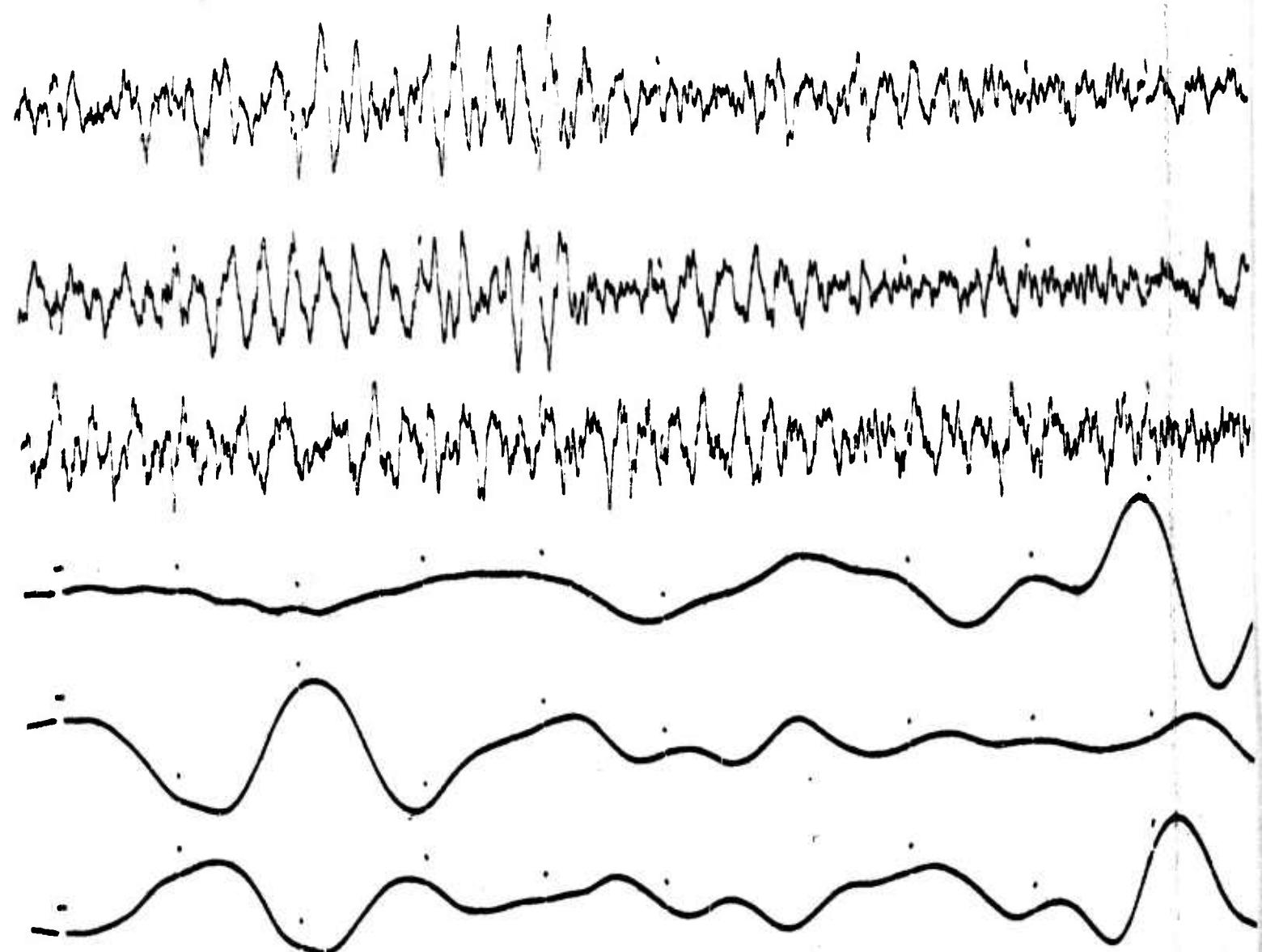
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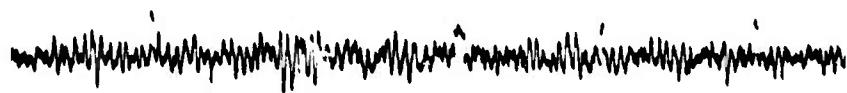
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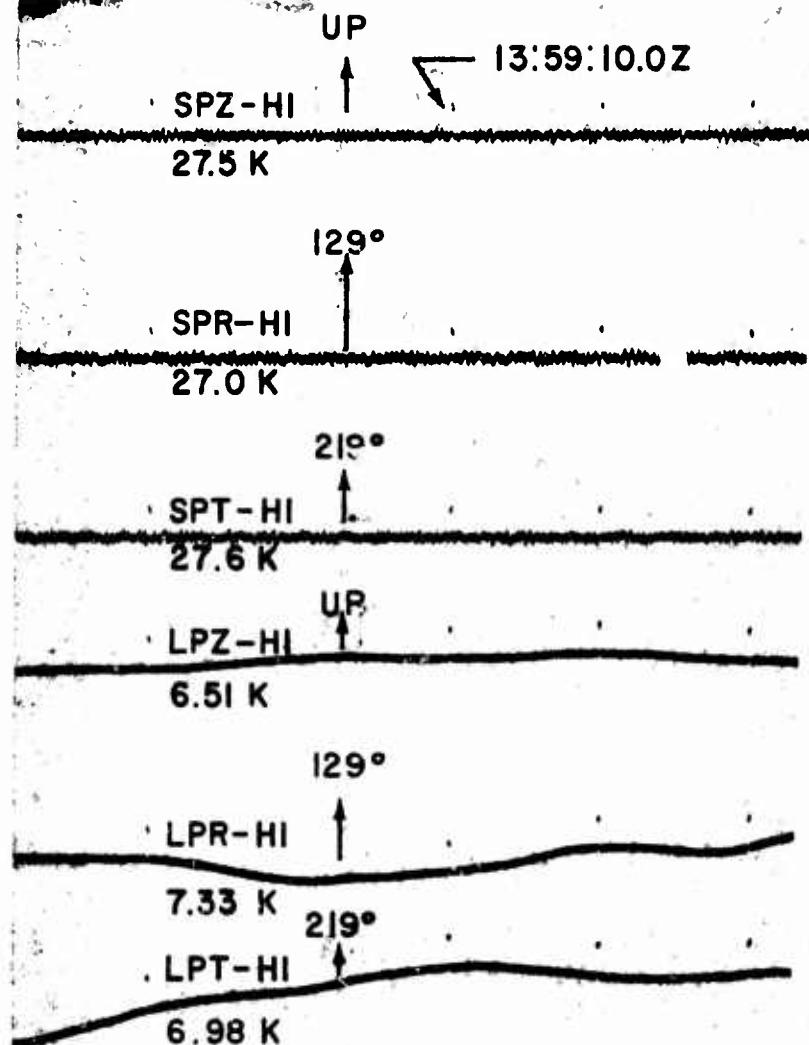
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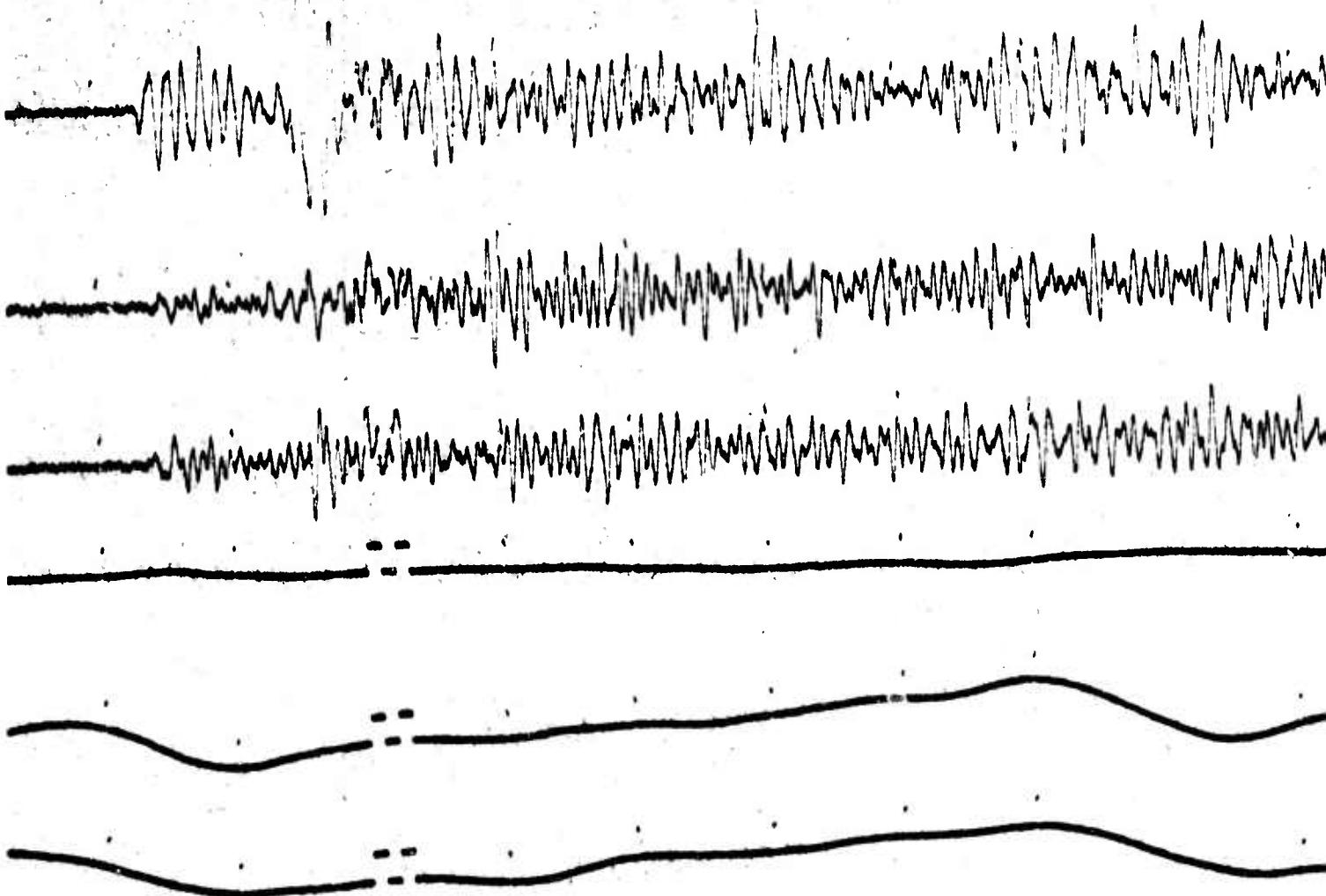
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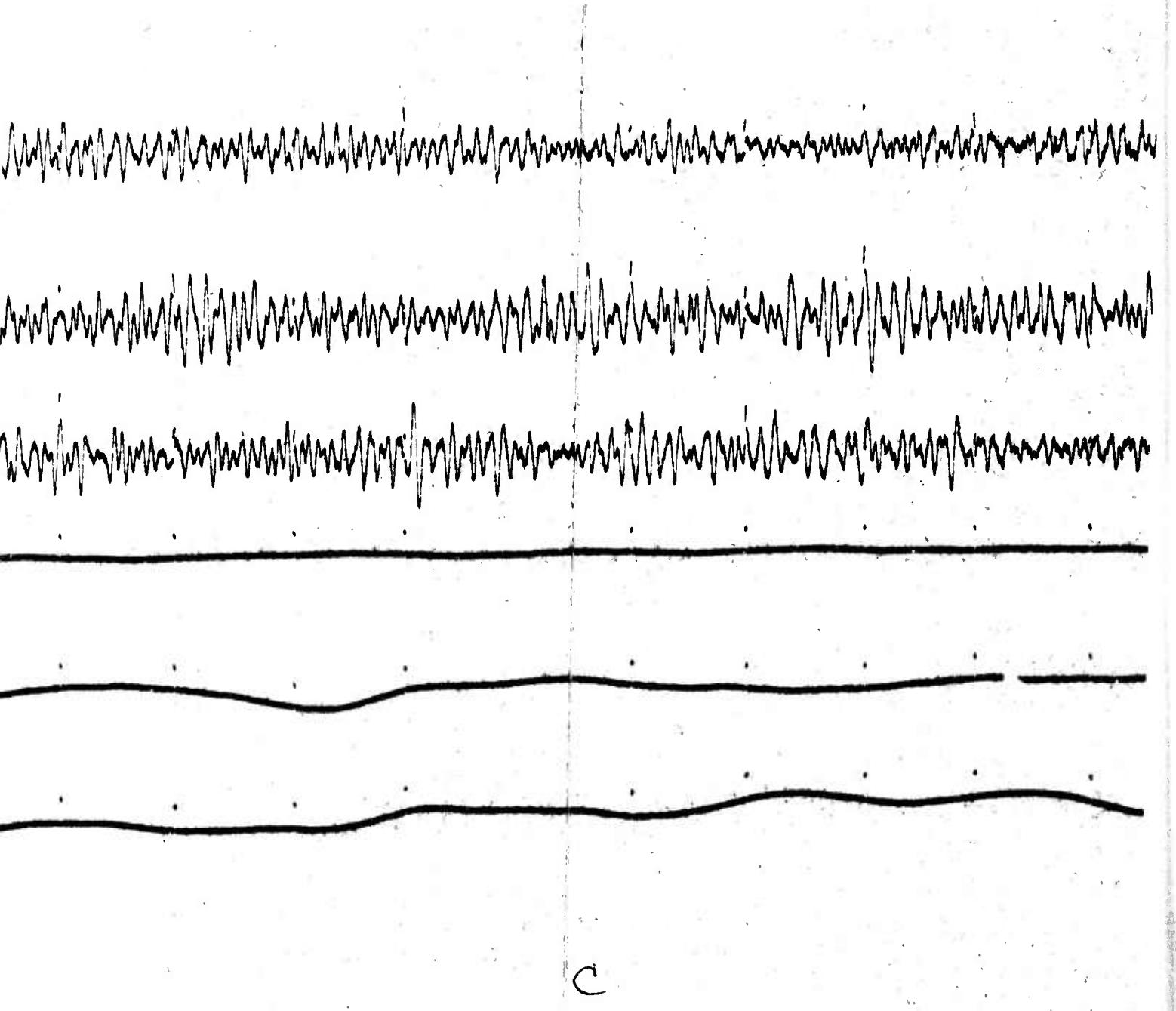
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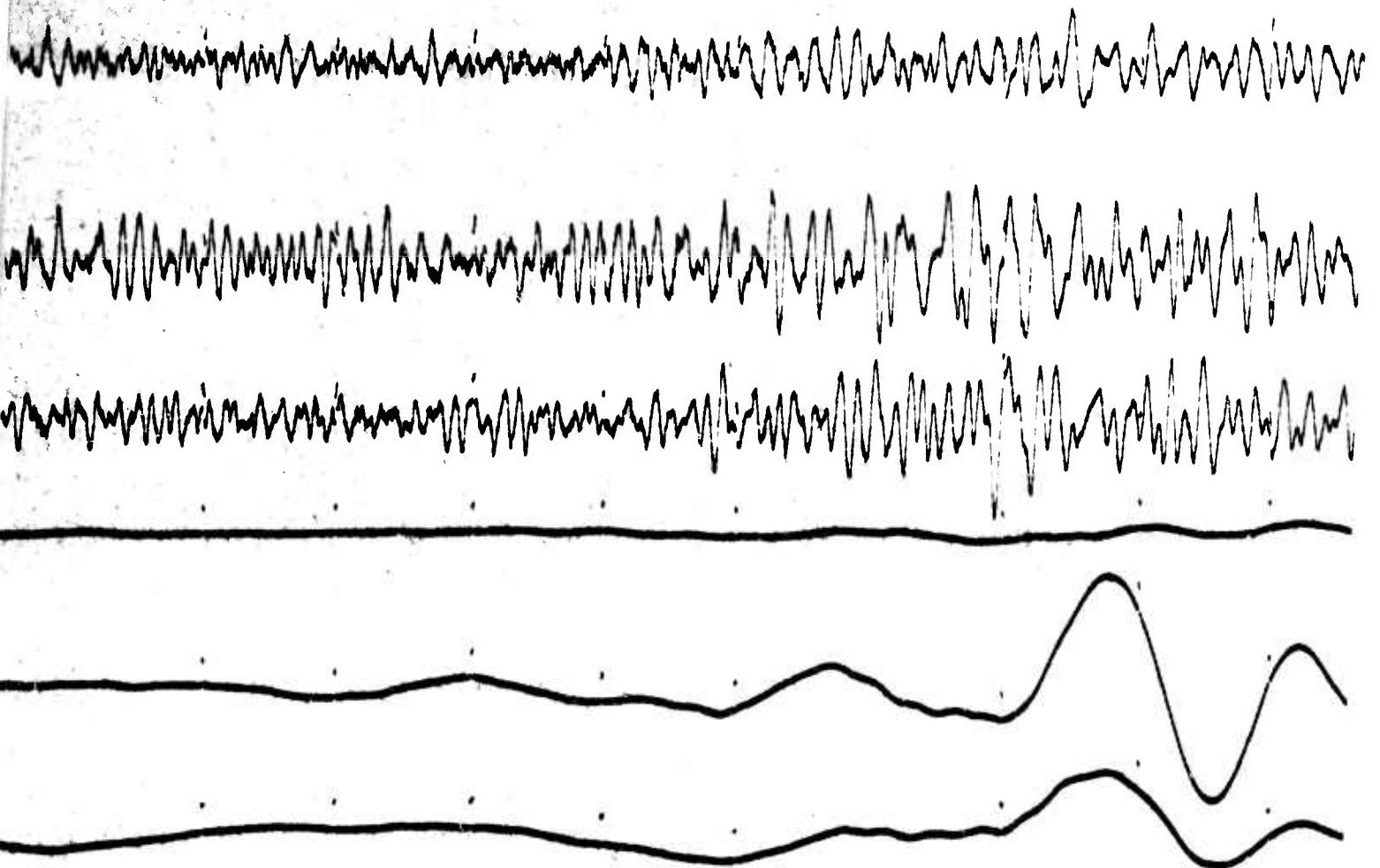
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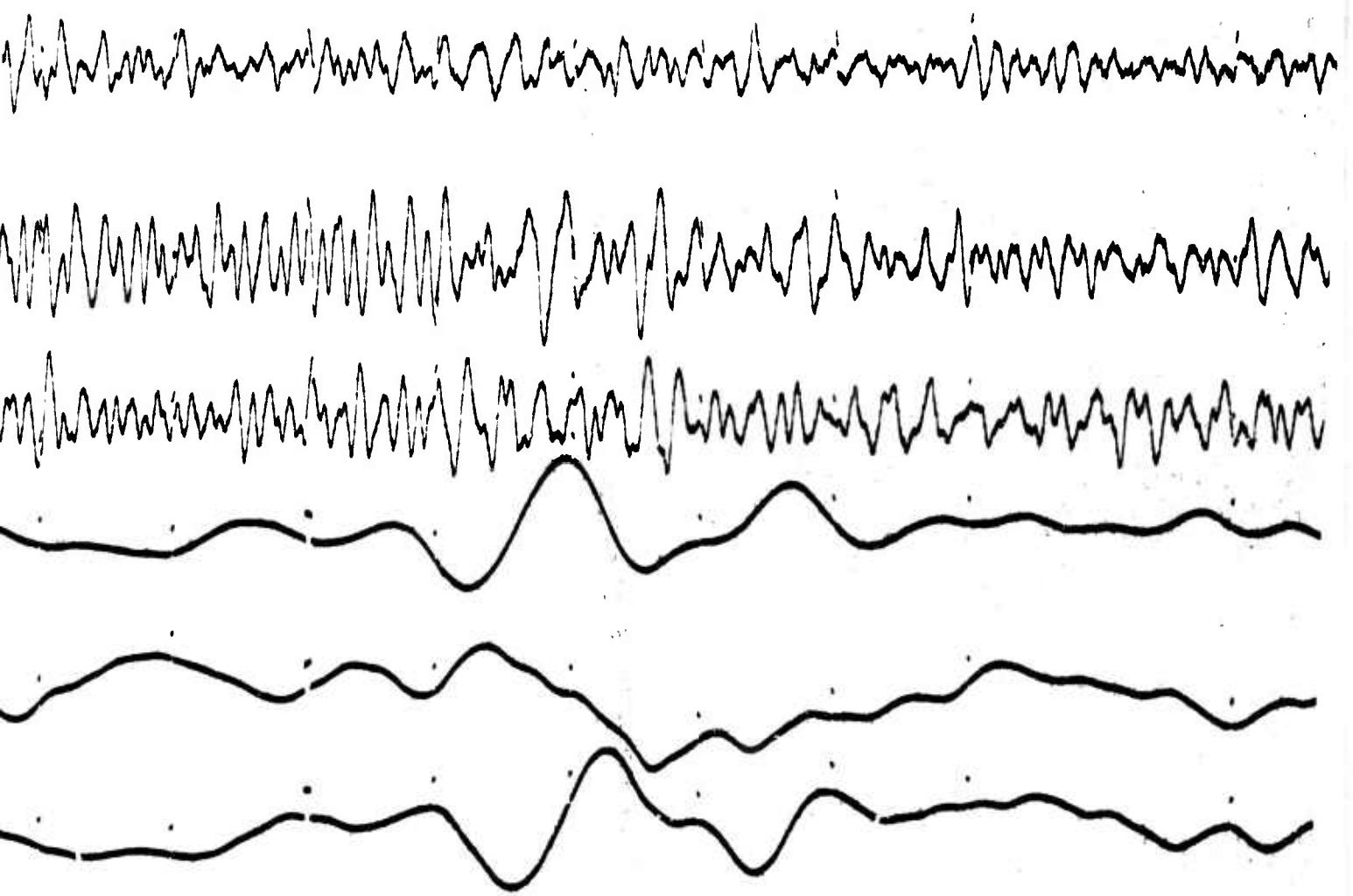


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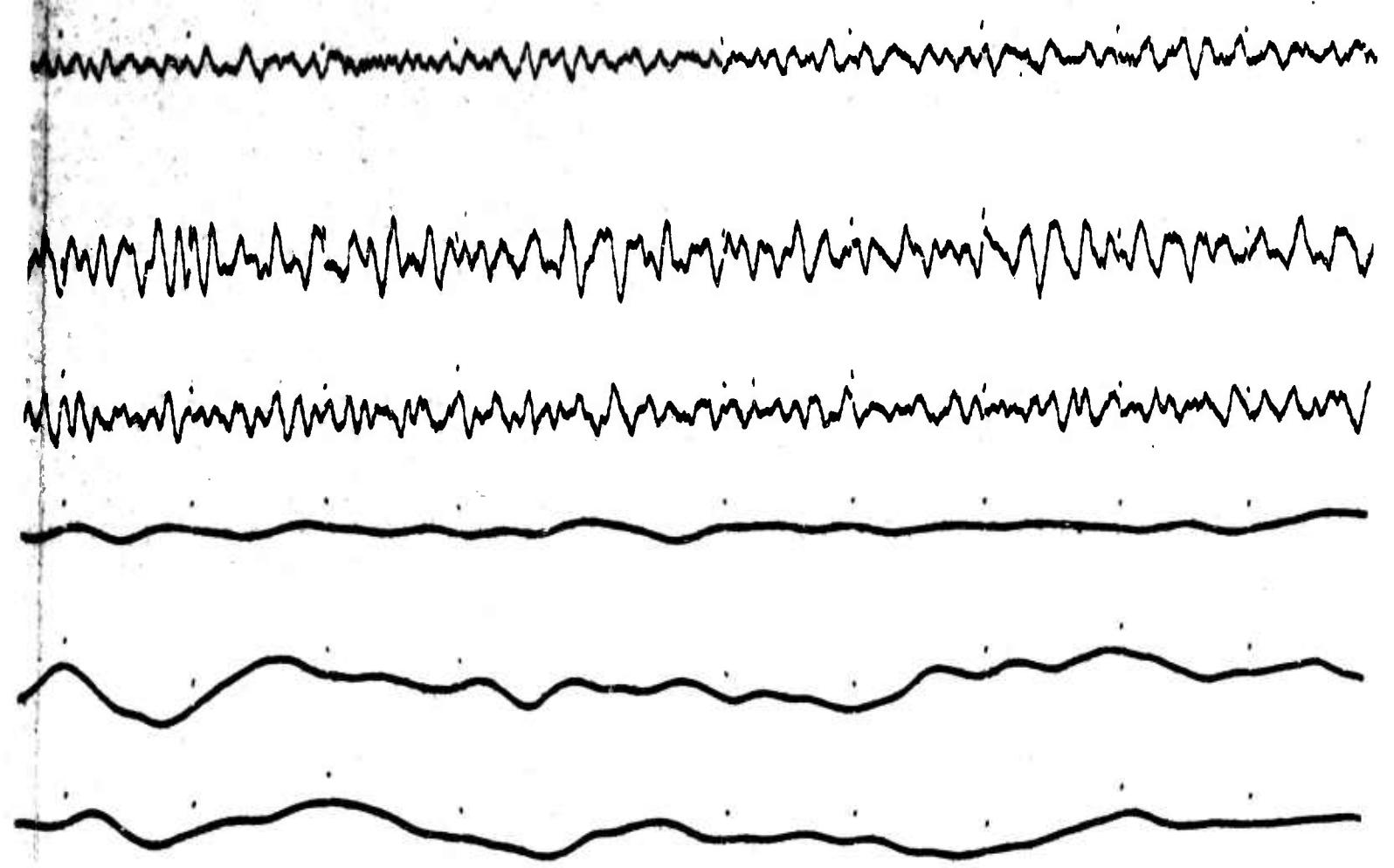




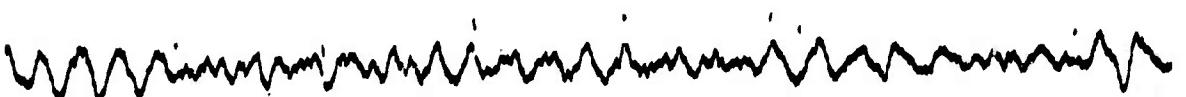
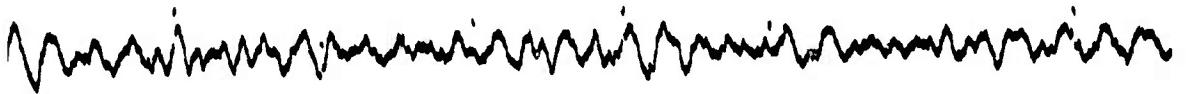
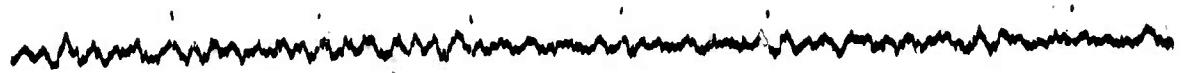
30



E



F



c

DUMONT

MN - NV

MINA, NEVADA

19 MAY 1966

$\Delta = 236 \text{ km}$

UP 13:56:20.0 Z

SPZ-LO
0.44 K

308°

SPR-LO
0.44 K

38°

SPT-LO
0.42 K

UP

LPZ-LO
0.46 K

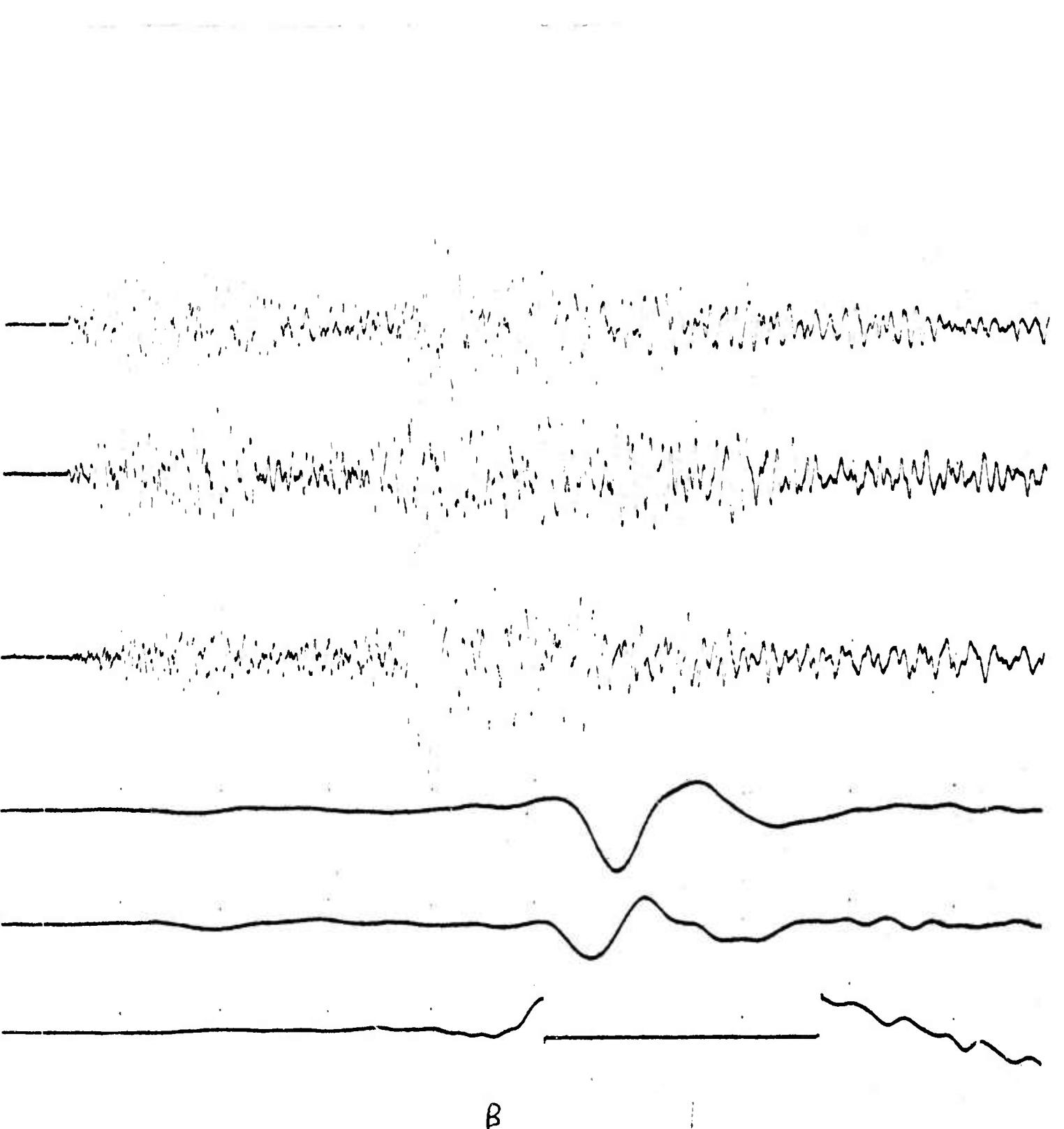
308°

LPR-LO
0.31 K

38°

LPT-HI
CLIPPED

A



B

W

V

W

--

--

--

C